INSTRUCTION MANUAL

SIMRAD
EQ44-2/EQ54-2

Echosounder

183-3453-102 06134.20 English

About this manual

The technical data, information and illustrations contained in this publication were to the best of our knowledge correct at the time of going to print.
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This manual combines operating and installation information for the EQ44-2 and EQ54-2 Echosounder. We recommend that you familiarise yourself with the basic instructions prior to installation or use.

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1.1 Introduction and system familiarization

Congratulations on your purchase of **SIMRAD EQ44-2/EQ54-2 Echosounder and Fishfinder** - a high performance echosounder in a unique slimline design with a bright 10" (EQ44-2) or 15" (EQ54-2) TFT color display.

The EQ44-2/EQ54-2 is both an echosounder system with selectable frequency i.e. 38, 50 or 200 kHz, providing an impression of what is to be found in the water under the vessel, and it is a repeater for navigational data from connected GPS receiver.

The **SimNet** data and control network provides high speed data transfer and control between Simrad products that are integrated as a total navigation, steering and communication system on board.

How to use this manual?
This manual is written for the products: EQ44-2 and EQ54-2, which share the same type of software. From hereon, these models are referred to as: **EQXX**. It is a good idea if you make yourself familiar with the key functions, menu structure and rotation of pages (screens) described in chapter 2 before you start out, and then proceed with section 2.5 Initial start-up. For quick location of a certain term, please check the "Glossary of terms" and the "Index" at the back of the manual. Also, "How to get started" further on in this chapter will give you a quick introduction to some of the features you have access to in your new echosounder.

The display examples shown in this manual are not always an exact copy of what you will see on the screen, as the presentation depends on your system configuration and choices of setup.

How to interpret special marked key symbols etc. in the manual:

+/-	Either the + (plus) or - (minus) key may be applied.
0-9	Alpha-numeric keys for insertion of figures.
A-Z	Alpha-numeric keys for insertion of letters.
☞	Emphasizes important points.
1,3	Indicates that you should press the keys [1] and [3] to obtain what is written in *italic* next to the key.

1.2 Safety summary

Precaution: Do not open the equipment, only qualified persons should work inside the equipment. If the glass in the screen breaks, be careful not to get cut on the sharp edges of the glass pieces.
☞ The lifetime of the internal battery is minimum 5 years. **If not exchanged before it goes flat, all data in the unit's memory will be lost.** We strongly recommend that you have the battery exchanged at your local Simrad workshop max. 5 years from date of purchase.

Power source, fuse and power cable: Check that the DC power supplied to the unit is within the range of 10 to 32 volts. Note that the appropriate fuse must be employed (see the fuse rating in section 12.10 Specifications). Ensure that the power cord is firmly attached.

Grounding: To reduce electrical interference and risk of electrical shock, properly ground the unit to the ship's ground using the ground screw at the rear of the unit. Good grounding should also be exercised for any equipment connected to the EQXX.

Quality service personnel: The EQXX is sealed and does not contain any user serviceable parts. Opening of the unit will void its warranty. Touching electrical parts inside may cause bodily harm. If the unit is not working properly, check sections 12.7 Preventive maintenance, 12.8 Repair and service, and 12.9 Troubleshooting. If your EQXX requires servicing or repair, call your authorized SIMRAD dealer.

Cleaning: Do not use any kind of strong solvents e.g. spirit, alcohol, gasoline or oils.

Glossary of terms: If you have never used an echosounder before or if you are unsure of how a term is used in this manual, then turn to Appendix A - Glossary of terms.

Default settings: All user implemented data in the EQXX can be erased by making a reset of the unit and thus return to factory default settings.

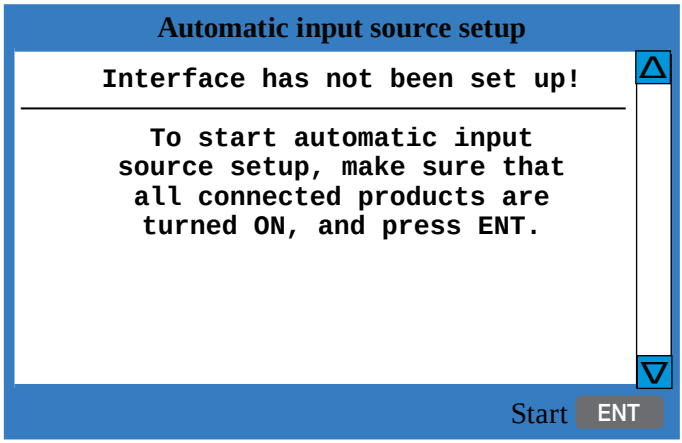
Software: The software version of the EQXX (see start-up display) should always be informed in a service situation.

1.3 How to get started

When starting up for the very first time, the first time after loading a new software or after a master reset: Make sure that all hardware installation and electrical connections are completed in accordance to the installation instructions.

PWR *Press and hold the* [PWR] *key until you have a picture on the screen*

The system will perform a software update and check for communication activity. When finished, a new start-up window will be presented on the screen:


Automatic input source setup
Interface has not been set up!
To start automatic input source setup, make sure that all connected products are turned ON, and press ENT.
Start
ENT

After making sure that all connected products are turned ON:

ENT *Press* [ENT] *to start automatic input source setup,* - if a new product is connected later on, refer to section 11.4 Interface setup.

New window: Automatic input source setup listing Data type, Group and Source of connected units.

ENT *Press* [ENT] *to continue*

PAGE *Press* [PAGE] *to scroll through a quick guide which informs of the use of the keys and where you can enter owner's setup, etc.*
- the quick guide is also accessible via [MENU], [8], [6].

ENT *Press* [ENT] *when ready to assume normal operation*
- go to [MENU], [8], [3] if you wish to make adjustments to the interface setup.

☞ To call up an echo display will require that the connected transducer type has been selected in the Echosounder setup - [MENU],[8],[STND].

1.3.1 Dedicated function keys

STND Press [STND] to call up the standard echo display.

Long press will toggle between echo, dual frequency, and custom screens.

B-LCK Press [B-LCK] to call up the bottom lock display.

Long press will toggle between echo, dual frequency, and custom screens.

ZOOM Press [ZOOM] to call up the zoom display.

Long press will toggle between echo, dual frequency, and custom screens.

SHIFT Press [SHIFT] to call up the shift display.

Long press will toggle between echo, dual frequency, and custom screens.

PAGE Press the [PAGE] key to toggle between the current active pages under the main function keys. Press for two seconds to start automatic rotation of these pages. Press any key to return to normal operation.

1.3.2 Echosounder features

A-scope - Press [ENT], [2] to toggle A-scope on/off. Echoes are displayed in a 'bar-graph' format. The strength of the actual echo is indicated by both width and color intensity.

Change frequency - Press [ENT], [1] to toggle between e.g. 50 and 200 kHz.

Gain - Adjust gain with the [GAIN-] and [GAIN+] keys to just below the point where you begin to see speckles of 'noise' on the screen.

Range - Select range by the numeric keys 1-9, or adjust with the +/- keys. Key 0 will select Auto Range.

Bottom expansion* - Press [B-LCK] to call up the bottom lock display. Activate bottom expansion to expand the view of the bottom in the echosounder display.

VRM expansion* - Press [ZOOM] to call up the zoom display. Activate VRM expansion to expand the view near the VRM - Variable Range Marker - in the echosounder display. Use the up/down cursor to activate and move the VRM line.

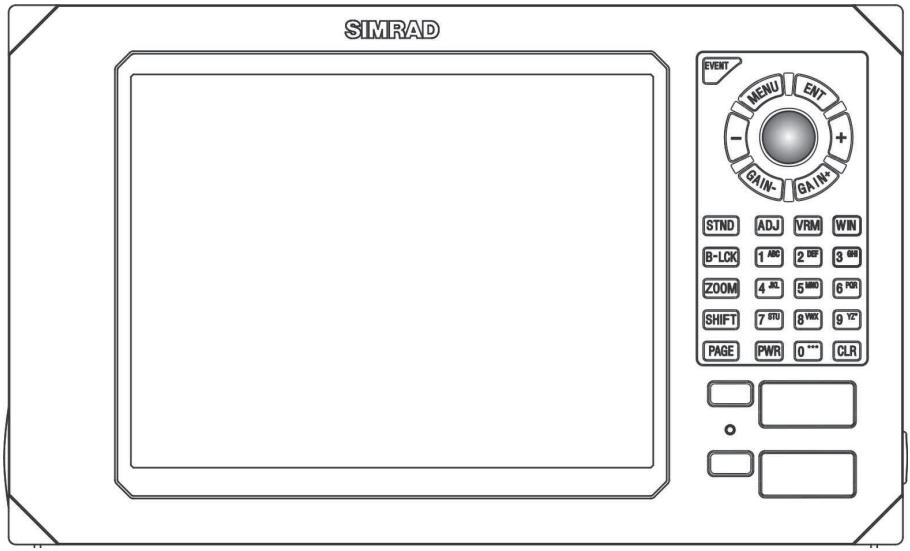
Shift display* - Press [SHIFT] to call up the shift display when operating in deep waters. Select the range for an expansion window. The expansion window can automatically follow a changing bottom or be set manually by the +/- keys.

*Return to standard echosounder display by pressing [STND].

Echo setup (presentation) - Press [ADJ] from echo display to access the setup display for either 38, 50 or 200 kHz. Press [ENT] to confirm changes, or leave the setup without having made any changes by pressing [MENU].

Echosounder setup - Press [MENU], [8], [STND] when you need to make any general settings, selecting a transducer or selecting demo mode etc.

Transmit power off - Press [ENT], [STND] to stop transmission in order to observe noise picked up by the transducer or to reduce power consumption.



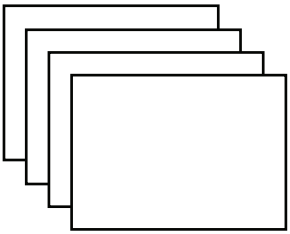
2.1 Fundamentals of the display and page system

The EQ44-2/EQ54-2 Echosounder has a multi-function screen and data presentation system with full screen and different types of split screens. The series of pages under the function keys (situated in the left column of the keypad) will in most situations be sufficient information for the operator.

In split screens consisting of up to four displays, the active display is indicated by a solid red frame. Use the [WIN] key to clockwise toggle between which display on the screen is active. Only active displays are operable.

The [PAGE] key differs from the other function keys. There are four pages under the [PAGE] key which can be set up to the presentation you prefer by exchanging an existing display in the PAGE system with a new one selected from a function key or via the menu - see next page. Single press on the [PAGE] key will toggle between the active pages under the function keys e.g.:

STND display	B-LCK display	ZOOM display	SHIFT display



Long press on the [PAGE] key will start a rotation of the four pages in intervals of 5 seconds (increase/decrease the time in [MENU], [8], [2]). Press any key to stop rotation.

2.1.1 Example of how to exchange a page in the PAGE system

The four pages in the PAGE system are collected from the STND, B-LCK, ZOOM and SHIFT menus in the sequence of which the function keys appear on the keypad ie. the first page is from the STND function, the second page is from the B-LCK function, the third page is from the ZOOM function, and the fourth page is from the SHIFT function. This sequence can not be changed, only the choice of display collected from each function can be changed e.g.:

PAGE *Press the* [PAGE] *key until the full screen standard display appears*

MENU *Call up the menu bar, and...*

1,3 *collect the Dual frequency display*
- or you can toggle between the available displays in the STND function by pressing (long press) the [STND] key repeatedly.

The same applies for the other three pages in the PAGE system ie. press the [PAGE] key until a display from the B-LCK, ZOOM or SHIFT function appears and then collect a new display from the appropriate menu.

☞ The display sequence under the function keys is the same as the display sequence in the matching menu.

2.1.2 Example of how to select a new display in a custom screen

In custom screens with multiple window combinations, all displays, which are not main function displays, are exchangeable. It is also possible to change the right half of the screen from half screen window to two quarter windows and vice versa. Example:

MENU *Call up the menu bar, and...*

Highlight a function e.g. Depth & temperature diagram in the MISC menu.

WIN

Press [WIN] *several times to check the screen image* (situated to the far right in the top line of the menu bar) *which windows the function can be placed into*

ENT

Press [ENT] *to enter the highlighted function into the highlighted window*

☞ If the function text in the menu is red, the display will not be available for the selected window.

2.2 Key functions

Some of the key functions are general and can be applied at any time, other key functions are related to a certain menu(s) and can only be applied when in the appropriate menu.

EVENT

Inserts a vertical mark at current ping and sends out WPL via NMEA to connected chartplotter.

MENU

Turns the menu bar on/off. Exits any data display without taking any action.

ENT

Confirms insertion and editing of data. Calls up quick menu.

Moves cursor in data displays. Moves left/right/up/down in the menu system. Adjusts gain (left/right). Activates and moves VRM (up/down) in echo display.

+/-

Changes echosounder range i.e. + (plus) for larger range and - (minus) for smaller range. Toggles between available values.

GAIN

Adjusts echosounder gain. Optimum adjustment: Press [GAIN+] till noise appears in ‘water’, then press [GAIN-] till noise just disappears again.

STND

Shortcut to standard echo displays. Long press will toggle between standard echo display in full screen, Dual frequency, and two custom screens.

B-LCK Shortcut to bottom lock displays. Long press will toggle between bottom lock display in full screen, Dual frequency, and two custom screens.

ZOOM Shortcut to zoom display. Long press will toggle between zoom display in full screen, Dual frequency, and two custom screens.

SHIFT Shortcut to shift display. Long press will toggle between shift display in full screen, Dual frequency, and two custom screens.

PAGE Toggles between active pages under the four main function keys i.e. [STND], [B-LCK], [ZOOM] and [SHIFT]. Long press starts automatic rotation of these pages. Press any key to stop rotation.

ADJ Gives access to setup displays related to active display. Scrolls through adjustable parameters.

VRM Toggles VRM - Variable Range Marker - on/off.

WIN Toggles between active windows in split screen. The active window will have a solid red frame. Only active windows are operable.

0-9 The alphanumeric keys inserts and selects data in data displays. Keys 1-9 are also Quick-range keys, which each represent a fixed echosounder range. Key 0 will activate auto range.

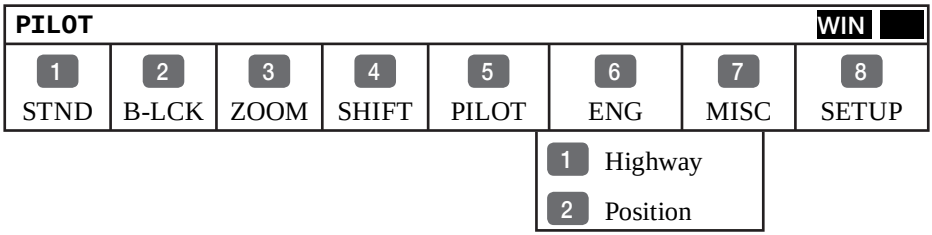
CLR Turns off VRM line in active display. Deletes data in enter or edit mode.

PWR Power on - hold key depressed till you have a picture on the screen. Calls up a window where you can adjust the brightness in the screen, background light in keypad, and select Daylight displays, Night display or custom made color palettes. Hold two seconds to turn the power off.

2.3 Menu bar

MENU *Toggles the menu bar on/off*

To fit the complete menu bar across the screen, some of the menus have been abbreviated. However, the last selected menu will be highlighted, and if it's an abbreviation of the menu, then the complete menu title is written above the menu bar.



Having selected e.g. 5:PILOT from the menu bar, its associated menus will drop down. Key in the number next to the function you wish to call forward, or use the cursor key to highlight the function and press [ENT].

If you want to switch to a different menu, use the cursor key left/right to move to the adjacent menu.

Most functions in the menus are general, and can be called forward at any time. Functions not currently available will have a different color from the rest of the functions. Not all functions are available in any window size i.e. full screen, half screen or quarter window. Use the [WIN] key to toggle between the windows in which the highlighted function can be presented. Keep an eye on the functions in the menu to see how they may change color as you toggle from window to window.

The menu bar will disappear from the screen at the selection of a function, or by pressing the [MENU] key. Besides, if not used, it automatically turns off after 30 seconds.

2.4 Menu layout

1 STND	2 B-LCK	3 ZOOM
1 50kHz	1 50kHz	1 50kHz
2 200kHz	2 200kHz	2 200kHz
3 Dual frequency	3 Dual frequency	3 Dual frequency
4 Custom screen 1	4 Custom screen 1	4 Custom screen 1
5 Custom screen 2	5 Custom screen 2	5 Custom screen 2

4 SHIFT	5 PILOT	6 ENG
1 50kHz	1 Highway	1 Engine status
2 200kHz	2 Position	2 Fuel and transmission
3 Dual frequency		3 Batteri status
4 Custom screen 1		4 2nd Engine status
5 Custom screen 2		5 2nd Fuel and transmission
		6 2nd Batteri status

7 MISC	8 SETUP
1 Decca lanes	STND Echosounder setup
2 Loran C	1 Pilot/Position setup
3 Depth & temperature diagram	2 Speed alarm, units & language
	3 Interface setup
	4 Palette setup
	5 Factory settings
	6 QuickGuide

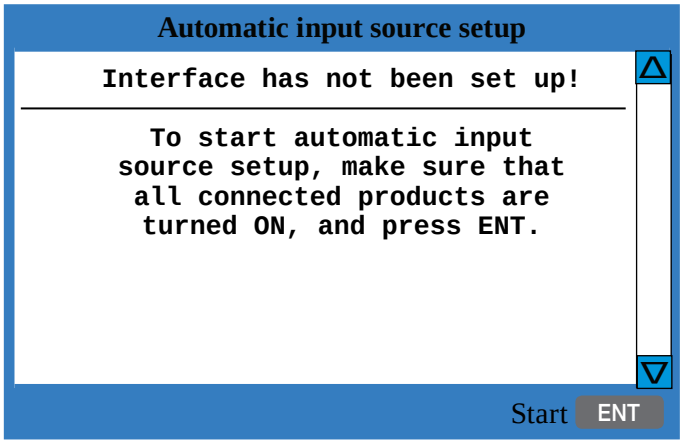
When selecting a sub-menu in the SETUP menu, the display will always appear in a pop-up window, so once you have accepted the changes or decided to just exit the display, then the display will disappear from the screen.

2.5 Initial start-up

When starting up for the very first time, the first time after loading a new software or after a master reset: Make sure that all hardware installation and electrical connections are completed in accordance to the installation instructions.

PWR *Press and hold the* [PWR] *key until you have a picture on the screen*

The system will perform a software update and check for communication activity. When finished, a new start-up window will be presented on the screen:


Automatic input source setup
Interface has not been set up!
To start automatic input source setup, make sure that all connected products are turned ON, and press ENT.
Start
ENT

After making sure that all connected products are turned ON:

ENT *Press* [ENT] *to start automatic input source setup,* - if a new product is connected later on, refer to section 11.4 Interface setup.

New window: Automatic input source setup listing Data type, Group and Source of connected units.

ENT *Press* [ENT] *to continue*

PAGE *Press* [PAGE] *to scroll through a quick guide which informs of the use of the keys and where you can enter owner's setup, etc.*
- the quick guide is also accessible via [MENU], [8], [6].

ENT *Press* [ENT] *when ready to assume normal operation*
- go to [MENU], [8], [3] if you wish to make adjustments to the interface setup.

PWR *Press* [PWR] *again to adjust the lighting in the screen and select day or night display etc., move around in display by means of the cursor key and change settings with +/- keys, and...*

ENT *Confirm with* [ENT]

Customizing the EQXX to suit individual needs can be done as you go along i.e. choose a different color for the display background, text, menu, etc. But to start out it will be wise to select the **display language** you prefer to use:

MENU *Call up the menu bar, and...*

8,2 *press* [8], [2] *to call up the language display*

Press up on the cursor to go to the bottom line in the display

+/- *Select language*

ENT *Confirm entry*

☞ To call up an echo display will require that the connected transducer type has been selected in the Echosounder setup - [MENU],[8],[STND].

2.6 Turn power on

Starting up for the first time, or after loading a new software, or after a master reset - see section 2.5. Starting up at any other time:

PWR *To turn on the EQXX, press and hold the* [PWR] *key until you have a picture on the screen*

ENT *Press* [ENT] *when the system is ready*

2.7 Turn power off

PWR *Call up INFO window, and...*

PWR *Press and hold until screen turns black*

The EQXX is now turned off. All the data and setups are saved and stored in the internal memory and, of course, will be available next time the unit is turned on.

2.8 Simrad WR20 Remote Commander (optional)

The WR20 is the first remote control that can both display and control the electronics on board when connected to the SimNet system. You can remotely command your NavStation with full MOB control from anywhere within a range of 100 m. You will have seamless control of pilot and navigation. You can make VHF calls from the WR20 and much, much more.

The new WR20 - your perfect helmsman

- Small rugged waterproof handset
- Display size: 35x25mm (1.4”x1.0”)
- Weight: 150 g
- Bluetooth Class 1
- Rechargable Li-Ion battery
- Backlit keypad
- Keypad lock
- Handy neck strap
- Environment: -10 to +55°C (-14 to +131°F)
- Dimensions H:133mm (5.2”), W:55mm (2.2”), D:32mm (1.3”)

3. Echosounder operation

The echosounder function of the EQXX determines the distance between its transducer and underwater objects such as fish, lake bottom or sea bed. It does this by utilizing the fact that an ultrasonic wave transmitted through water travels at a nearly constant speed of 1500 meters (4800 feet) per second. When a sound wave strikes an underwater object such as fish or sea bottom, part of the sound wave is reflected back toward the source. Thus by calculating the time difference between the transmission of a sound wave and the reception of the reflected sound wave, the depth to the object can be determined.

The entire process begins in the display unit. Transmitter power is sent to the transducer as a short pulse of electrical energy. The electrical signal produced by the transmitter is converted into an ultrasonic signal by the transducer and transmitted into the water. Any reflected signals from intervening objects (such as a fish school) are received by the transducer and converted back into an electrical signal. It is then amplified in the amplifier section, and finally, displayed on the screen.

The picture displayed is made up of a series of vertical scan lines (pings), one for each transmission. Each line represents a 'snapshot' of what has occurred beneath the boat. The series of snapshots are accumulated side by side across the screen, and the resulting contours of the bottom and fish between the bottom and surface are displayed.

Selecting echosounder displays

The EQXX provides various types of echosounder displays: standard echogram, A-scope, bottom expansion (zoom), VRM expansion and shift presentation. Each display has its special advantages. Select the appropriate setup for the echosounder display in the presentation "Setup" (see section 4.7), and "Echosounder setup" (see section 10.1) displays, considering current sea area and target fish.

3.1 Parts of an echosounder

An echosounder is composed of a display screen, processor, and transmitter/receiver unit which in the case of the EQXX are housed in one unit. Connected to this unit by a shielded cable is the transducer, which is mounted horizontally on the bottom of the hull or on the transom.

The display screen presents in graphic and numerical form the information the processor is receiving and accumulating from the transducer.

The processor is the "brain" of the echosounder. It is sealed inside the unit which protects it from harm. The processor is composed of highly sophisticated microprocessor, memory and logic circuitry.

The transmitter/receiver (often called the "transceiver") section of your echosounder takes it's commands from the processor. The processor tells the transceiver to activate the transmitter. The transmitter sends a high voltage transmit "ping" to the transducer mounted on the hull. At that point the transmitter's job is done and the receiver takes over (see fig.1 in section 3.2).

The receiver is also connected to the transducer and amplifies the very small signals received as echoes from fish and the sea floor which arrive at the transducer (see fig.2 in section 3.2). The receiver is designed to reject other signals as much as possible and provide enough amplification to see even relatively small targets at long ranges.

The amplified receiver signals are then send to the processor to be shown on the display screen.

The transducer can be single or multiple ceramic elements in a rugged housing made from reinforced plastic, bronze or stainless steel. The transducer is attached horizontally to the bottom of the hull. It is essential that the transducer be mounted properly, as echo transmissions are radiated at right angles from the transducer face. Shielded cables connect the transducer with the echosounder.

3.2 How the echosounder works

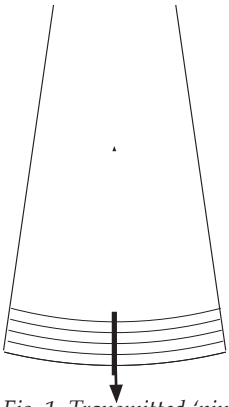


Fig. 1 Transmitted 'ping' from the transmitter/receiver.

When the EQXX is turned on, a transmitter begins to send electrical pulses to the transducer. The ceramic resonator in the transducer has a special property which enables it to change dimensions slightly when a varying voltage is applied.

The voltage is thus converted to mechanical vibrations (sound waves) which are then transmitted down through the water.
See Fig. 1.

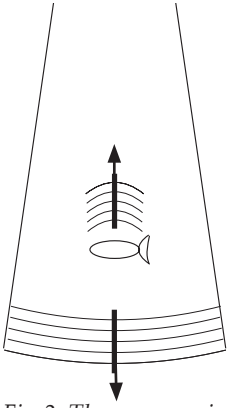


Fig. 2 The up arrow indicates: Echo returning to the receiver. The down arrow indicates: Transmitted pulse.

The sound waves move through the water until they encounter a change in density, such as a fish or the bottom. This causes the sound waves to 'echo' back up through the water. When the reflected sound waves (echoes) hit the transducer, the ceramic disk vibrates at the same frequency. This generates a varying voltage which goes back up through the cable to the receiver.
The EQXX amplifies and processes the signals and presents them on the display screen.
See Fig. 2.

3.3 Transducer beam width

The transducer mounted to the hull of your vessel serves as both a ‘speaker’ when transmitting, and as a ‘microphone’ when the echosounder is receiving. Similar to the way a flashlight focuses light, most of the sound from your transducer is focused downwards with a smaller amount going out to the sides. The amount of focusing of the sound beam is expressed as a ‘beam width’.

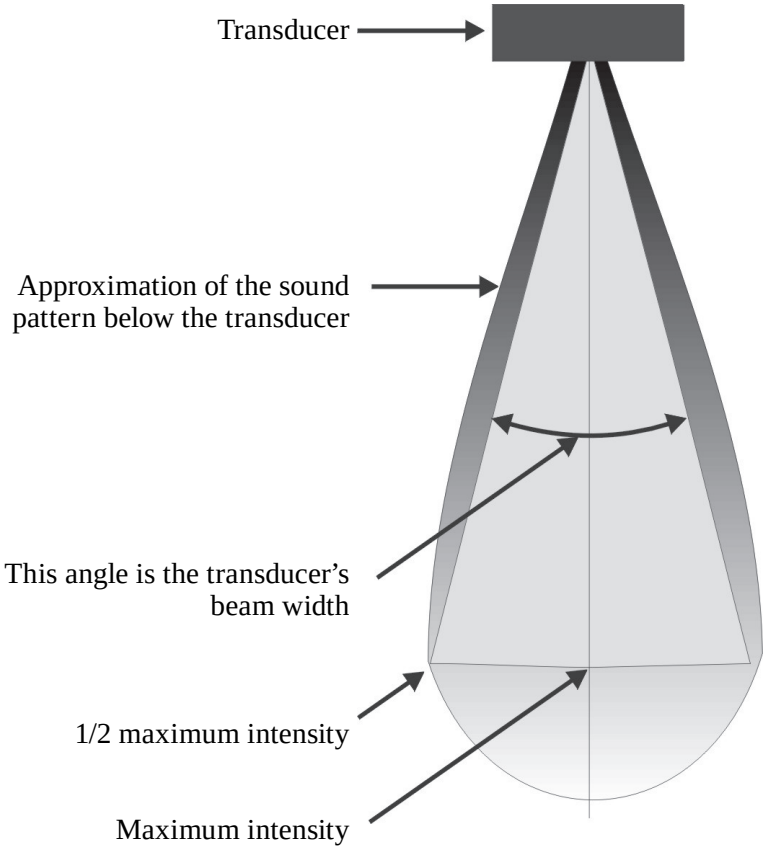

Transducer
Approximation of the sound pattern below the transducer
This angle is the transducer’s beam width
1/2 maximum intensity
Maximum intensity

Fig. 3 A representation of a transducer beam width.

The center of the sound beam is the most intense, then as you move out towards the sides of the sound beam there is a point where the intensity of the sound is half what it was in the center. The distance moved is the ‘beam width’. See Fig. 3.

3.4 Effects of the vessel's speed

The presentation of fish on the EQXX depends directly on the vessel's speed, as well as on the depth of the fish. When the vessel is at rest, the echo traces will appear stretched and flattened. As the vessel's speed becomes greater, the echo traces will become shorter and more arched. The reason for this change in appearance is that as the vessel speed increases, fewer number of sound 'pings' strike each fish. A low vessel speed will provide the most accurate information of where fish are located.

4.1 STND menu

1 STND
1 50kHz (38kHz)
2 200kHz
3 Dual frequency
4 Custom screen 1
5 Custom screen 2

Low and high frequency echosounder display can be set up separately. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

The Dual frequency display will provide both the 50kHz and the 200kHz echo displays in one screen.

The two custom screens will present multiple window combinations (section 4.2), where one of the main echo displays i.e. 50kHz or 200kHz will be fixed in the left half of the screen. Adjustments can be made individually to both displays (section 4.7).

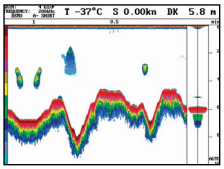
MENU
1,2

To access one of the displays via the menu e.g.:
Call up the menu bar, and...
press [1] *and* [2] *to call up the standard echo display for 200kHz in full screen* - see display example on next page.

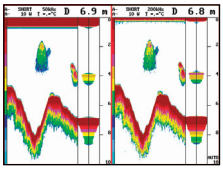
4.2 Shortcut to the pages in the STND echo-series

The STND function is one of the main functions in the EQXX. Each page under the [STND] key will include a window representing the standard echo function. It is not possible to exchange main function displays with a new display. Refer to section 2.1, 2.1.1 and 2.1.2 for further information on the display and page system.

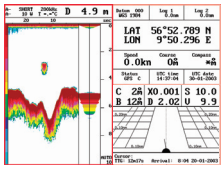
From any display:
STND Long press on the [STND] key will toggle between:



38/50kHz or 200kHz full screen



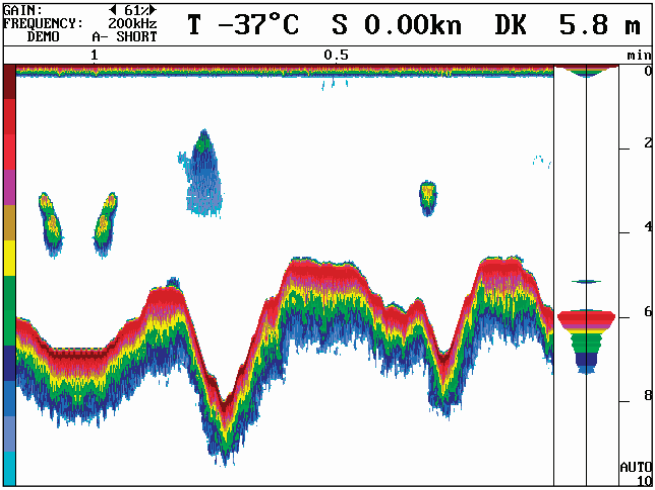
Dual frequency



Custom screen 1+2

4.3 Standard echo display

This is the basic presentation mode (standard display) for observing fish schools and sea bed. Some surface noise may appear just below the transmission line.



Transmission line.
Time scale.

Depth range is adjustable with +/- keys or the Quick-range keys 1-9.
Press key 0 to return to Auto range.

The data field is preset to show: Gain level, Frequency, Transmit pulse length **A- SHORT** (set to AUTO), Transmit power **A- 10W** (set to AUTO), see section 4.7.
Water temperature **T** in Celcius or Fahrenheit (in 1/10 degrees), water or SOG speed **S** in knots or kilometers/hour or miles/hour, actual depth ***DK** - units can be changed in Setup for units (MENU, 8, 2).

*) Actual depth i.e. **D**epth below **K**eel/Surface/Transducer - settings can be changed in Echosounder setup (MENU,8,STND).

1-9 *Select range in 9 steps*

+/- *Adjust range with the + and - keys*

0 *Activate Auto range*

Press cursor left/right to adjust gain

ADJ *Direct access to Setup display related to active echo display 50kHz or 200kHz* - (see section 4.7)

Use the cursor to go to the function you wish to change the value for

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit Setup display*

4.4 Variable range marker

VRM – Variable Range Marker – refers to a horizontal black line shown on the display screen. The user can measure the range to targets shown on the display screen by use of the VRM. The depth to the VRM can be seen in the top left side of the screen for a few seconds after the VRM line is moved.

From active echo display:

Activate the Variable Range Marker function, and...

Move the VRM up/down

+/- *Adjust the range by means of the +/- keys*

CLR *Turn VRM off again*

☞ The VRM line can also be toggled on/off by the [VRM] key.

4.5 Echo quick menu

A number of echo features can easily be accessed from the Echo quick menu.

From active echo display:

ENT *Call up the Echo quick menu* with access to the following features:

Echo quick menu	
1	Change frequency
2	Hide A-scope
STND	Transmit power off
MENU	Exit

1 *Change frequency* will toggle between 38, 50 or 200kHz displays (Airmar transducers) to suit the task.
200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam.
38 and 50 kHz are for searching in a wider area, determining bottom conditions and going the deepest.

2 *Hide/Activate A-scope* The amplitude scope at the right side of the echo display indicates the precise amplitude or strength of the last received ping (sounding), which often can be used for determining individual species of fish or hardness of the bottom. Pressing [2] from the quick menu will toggle between Activate or Hide A-scope.

STND *Transmit power off* will stop transmission in order to observe noise picked up by the transducer.

MENU *Abandon the Echo quick menu without making any changes*

4.6 Plot event mark on echo display

From active echo display:

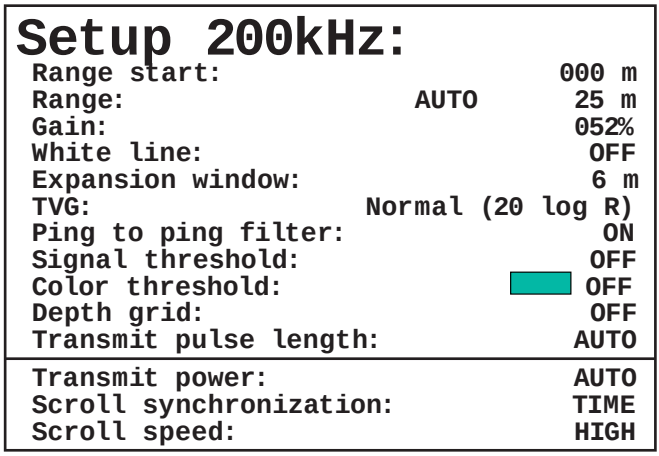
EVENT Inserts a vertical mark at current ping and sends out WPL via NMEA to connected chartplotter.

4.7 Presentation setup

The general Echosounder setup e.g. Selecting transducer, Alarm settings, Demo mode etc. is placed in the SETUP menu (section 10.1).

The echo setup in this chapter are the most common settings for adjusting the presentation of the high or low frequency echo picture, and can be accessed by a single keystroke.

ADJ *Press* [ADJ] *from active echo display*



Use the cursor key to move cursor around in the display

0-9 *Key in new figures, or...*

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit display*

Range start – allows the user to set the displayed depth range to begin at some point below the surface. For example, a 100 meter displayed range can be “phased” downwards, so that the screen shows a 100 meter section beginning at, say, 200 meters and going to 300 meters depth.

Range – refers to the distance shown from the top to the bottom of the display screen. Selecting **Auto range** will cause the EQXX to change the basic range setting(s) to keep the displayed bottom in the lower half of the display. For instance, as your boat moves into deeper waters, the system will automatically switch to a deeper range, always keeping the displayed bottom in the lower half of the display. **Manual range** allows the operator to set the range displayed on the screen.

Gain – is another way of saying "sensitivity", or possibly "volume". Increasing the gain setting of the EQXX will allow you to see smaller and deeper targets. If the gain is set too high, however, you will begin to see "noise" and unwanted targets. Generally speaking, you want to set the gain control just below the point that you begin to see speckles of "noise" between surface and the bottom on the screen.

White line – is a control which places a white/black line at the displayed sea floor and blanks out 4 pixels just below the line. The purpose of this is to help the user detect targets, such as fish, which are very close to the sea floor and whose echoes tend to merge with those of the sea floor itself.

Expansion window (zoom level) - can be selected in eight steps, ranging from 1 to 50 meters, or converted to feet or fathoms (refer to Setup for units, section 11.3). This function allows you to take a closer look at a particular section of the water underneath your boat. You can expand the view near the bottom (Bottom expansion) or near the Variable Range Marker (VRM expansion).

TVG – Time Varying Gain – is a control that allows the EQXX to make corrections for most of the losses and absorption that occurs as sound energy passes through sea water. There are three settings to choose from, Normal, Special and OFF.
The setting "Normal (20 log R)" is for general fish finding at depths down to 50m (150') and it will also give a uniform bottom echo presentation at shallow, mid and deep water.
The setting "Special (40 log R)" will adjust the TVG to show the same echo strength for a given size fish at varying depths.
The OFF position is used for net sounders. In OFF position the TVG is inactive which means that the sounder operates with a fixed gain between each transmitter pulse. Auto range is switched to manual.

Ping to ping filter – can be set to either on or off. With the filter "off", then each received echo will be reflected on the screen. Whereas with the filter "ON", the system will compare every two echoes received and only reflect on the screen what is received from both echoes, which will give a more uncluttered recording.

Signal threshold – can be set to ON to eliminate the appearance of unwanted noise. The threshold level is automatic and the feature should be used with caution, as it may eliminate small fish and small unidentified objects on the screen.

Color threshold – the color threshold function allows the "weaker" targets and noise which may be shown on the display screen to be eliminated from the display. These targets are usually shown in the weaker target colors such as blues and greens. The Color threshold allows you to choose not to display the blues, or the blues and greens, etc. Doing this will leave only the stronger targets on the display screen.

Depth grid - enables a more precise reading of depth and target relations across the screen.

Transmit pulse length – can be set OFF to observe noise in the water (Auto range will switch to manual mode). Set to AUTO, the optimum setting will be applied according to the water depth. Or it can be set manually, if a specific pulse length is required:

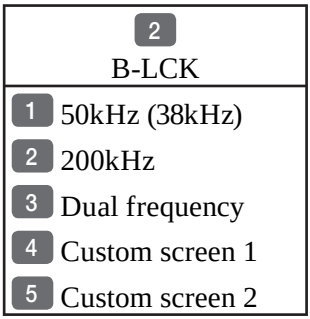
SHORT	less than 10m deep water
MEDIUM	between 10 and 50 m deep water
LONG	more than 50m deep water
☞ *A long pulse will reach deeper but give less resolution.*	

Transmit power – should normally be left on AUTOmatic.
The modes available are: AUTO, 1000W, 500W, 100W and 10W. When operating above 100W, the ping rate will be max. 10 pings per second. Operating at 100W or 10W will enable a ping rate of up to 25 pings per second.

Scroll synchronization – the screen can be updated on the basis of time or distance (when data from last ping appears on the display).

Scroll speed – is the ping rate and movement of the presentation of echoes on the screen, moving from right to left. It is adjustable (Low, Medium, High, Max, Freeze), to allow the user to show a longer “history” on the display screen, if desired.

5.1 B-LCK menu



Low and high frequency echosounder display can be set up separately. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

The Dual frequency display will provide both the 50kHz and the 200kHz echo displays in one screen.

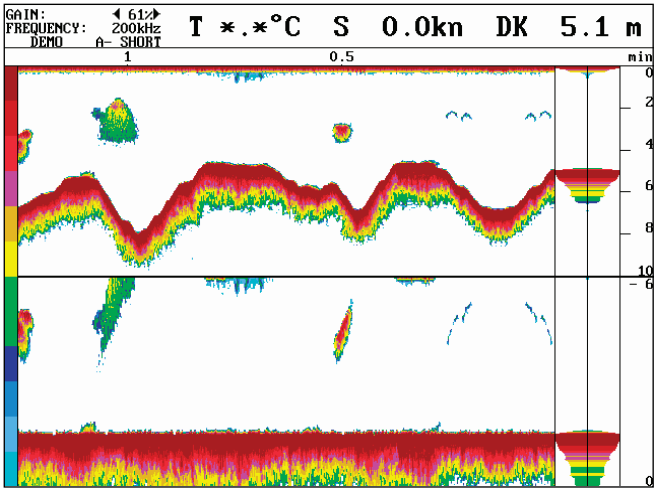
The two custom screens will present multiple window combinations (section 4.2), where one of the main echo displays i.e. 50kHz or 200kHz will be fixed in the left half of the screen. Adjustments can be made individually to both displays (section 4.7).

Shortcut to the pages in the B-LCK echo-series
The B-LCK function is one of the main functions in the EQXX. Each page under the [B-LCK] key will include a window representing the bottom lock function. It is not possible to exchange main function displays with a new display. Refer to section 2.1, 2.1.1 and 2.1.2 for further information on the display and page system.

MENU
2,2

To access one of the displays via the menu e.g.:
Call up the menu bar, and...
press [2] *and* [2] *to call up the bottom lock display for 200kHz in full screen* - see display example on next page.

The advanced bottom lock and expansion feature ensures a reliable depth readout and provides a compressed standard display in the upper part of the screen. The bottom area can be magnified for better separation of echoes. The actual size of the expansion window can be adjusted in the presentation setup.



Transmission line. Time scale.

Depth range is adjustable with +/- keys or the Quick-range keys 1-9.

Press key 0 to return to Auto range.

Press cursor left/right to adjust gain

ADJ *Direct access to presentation setup related to active echo display 50kHz or 200kHz* - (see section 4.7)

Use the cursor to go to the function you wish to change the value for

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit Setup display*

Echo quick menu

ENT *Call up the Echo quick menu* with access to the following features:

- Change frequency.
- Activate/hide A-scope
- Turn transmit power on/off

6.1 ZOOM menu

3 ZOOM
1 50kHz (38kHz)
2 200kHz
3 Dual frequency
4 Custom screen 1
5 Custom screen 2

Low and high frequency echosounder display can be set up separately. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

The Dual frequency display will provide both the 50kHz and the 200kHz echo displays in one screen.

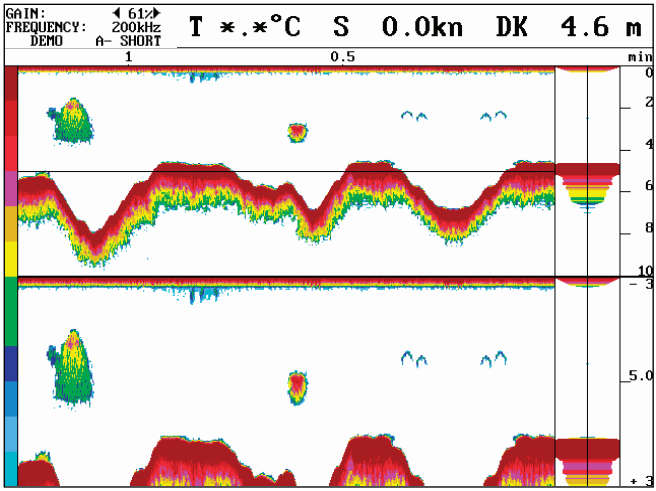
The two custom screens will present multiple window combinations (section 4.2), where one of the main echo displays i.e. 50kHz or 200kHz will be fixed in the left half of the screen. Adjustments can be made individually to both displays (section 4.7).

Shortcut to the pages in the ZOOM echo-series
The ZOOM function is one of the main functions in the EQXX. Each page under the [ZOOM] key will include a window representing the zoom function. It is not possible to exchange main function displays with a new display. Refer to section 2.1, 2.1.1 and 2.1.2 for further information on the display and page system.

MENU
3,2

To access one of the displays via the menu e.g.:
Call up the menu bar, and...
press [3] *and* [2] *to call up the zoom display for 200kHz in full screen* - see display example on next page.

This feature will provide an expanded view of the area near the *VRM line which will give a better separation of echoes. The actual size of the expansion window can be adjusted in the presentation setup.
*) See section 4.4 Variable range marker.



Transmission line.
Time scale.

Depth range is adjustable with +/- keys or the Quick-range keys 1-9.

Press key 0 to return to Auto range.

Press cursor left/right to adjust gain

ADJ *Direct access to presentation setup related to active echo display 50kHz or 200kHz* - (see section 4.7)

Use the cursor to go to the function you wish to change the value for

+/- *Toggle between available values*

ENT *Confirm changes, or...*

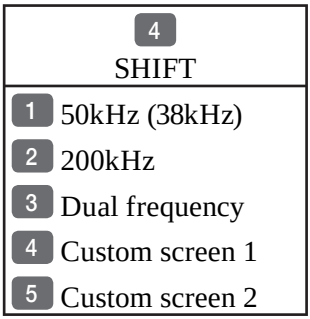
MENU *Abandon changes and exit Setup display*

Echo quick menu

ENT *Call up the Echo quick menu* with access to the following features:

- Change frequency.
- Activate/hide A-scope
- Turn transmit power on/off

7.1 SHIFT menu



Low and high frequency echosounder display can be set up separately. The low frequency display will show deep water bottom contours, and the high frequency display will show the mid-water section with trawl targets or bait fish in a higher resolution.

The Dual frequency display will provide both the 50kHz and the 200kHz echo displays in one screen.

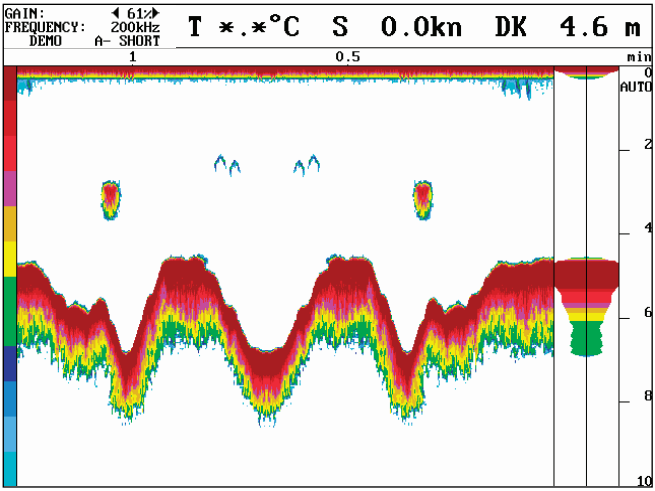
The two custom screens will present multiple window combinations (section 4.2), where one of the main echo displays i.e. 50kHz or 200kHz will be fixed in the left half of the screen. Adjustments can be made individually to both displays (section 4.7).

Shortcut to the pages in the SHIFT echo-series
The SHIFT function is one of the main functions in the EQXX. Each page under the [SHIFT] key will include a window representing the shift function. It is not possible to exchange main function displays with a new display. Refer to section 2.1, 2.1.1 and 2.1.2 for further information on the display and page system.

MENU
4,2

To access one of the displays via the menu e.g.:
Call up the menu bar, and...
press [4] *and* [2] *to call up the shift display for 200kHz in full screen*
- see display example on next page.

This feature can be applied when operating in deep waters. The expansion window can automatically follow a changing bottom or be set manually by means of the numeric keys 1-9, and then use the +/- keys or cursor to move the window up/down.
Press the [0] key for automatic bottom tracking.



Transmission line.
Time scale.

Press cursor left/right to adjust gain

ADJ *Direct access to presentation setup related to active echo display 50kHz or 200kHz* - (see section 4.7)

Use the cursor to go to the function you wish to change the value for

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit Setup display*

Echo quick menu

ENT *Call up the Echo quick menu* with access to the following features:

- Change frequency.
- Activate/hide A-scope
- Turn transmit power on/off

8. PILOT menu

5 PILOT
1 Highway
2 Position

8.1 Highway display

To present any information in the EQXX highway display will require that a navigator is connected via SimNet or the NMEA input port - refer to section 12.5 Electrical connections.

☞ The connected navigator must be in navigation mode, which could be Cursor, Waypoint, Route or Track navigation - see next page.

8.1.1 Navigation setup

MENU
5,1

Call up the menu bar, and...
load Highway display

Since there is no navigation mode active, you will receive the legend: NAVIGATION IS OFF. To enter the basic Navigation setup:

ADJ

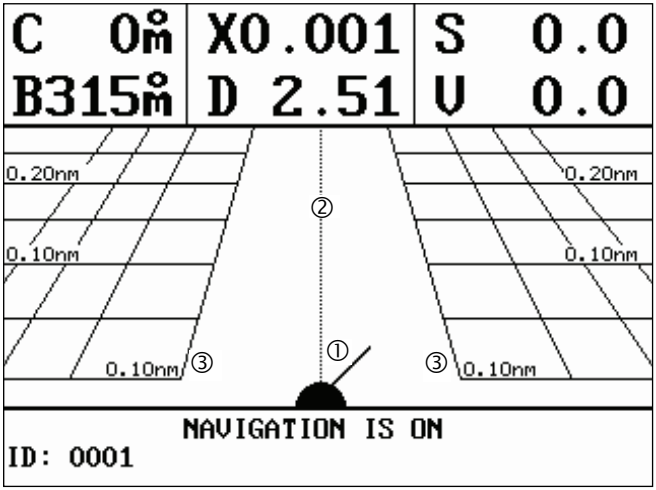
Load Navigation setup

Navigation setup:	
XTE distance:	**00.10nm**

Alarm distance can be changed in this display, but alarm can only be initiated from the connected navigator. Maximum setting in nautical miles is 9.99 nm.

ENT *Return to Highway display*

Highway display (with active navigation mode)



Nautical miles indication (0.10nm and 0.20nm) on horizontal lines indicates how many nautical miles there are from ship's position to the horizontal line.

C: Course over ground
X: Cross-track-error
S: Speed over ground
B: Bearing to approaching WP
D: Distance to waypoint
V: Speed towards WP (velocity)

Bottom line indicates name/number of approaching waypoint or routepoint.

① Ship's position and heading in relation to intended track.

② Ideal course line between two waypoints starting from ship's position when a navigation mode is activated on connected navigator.

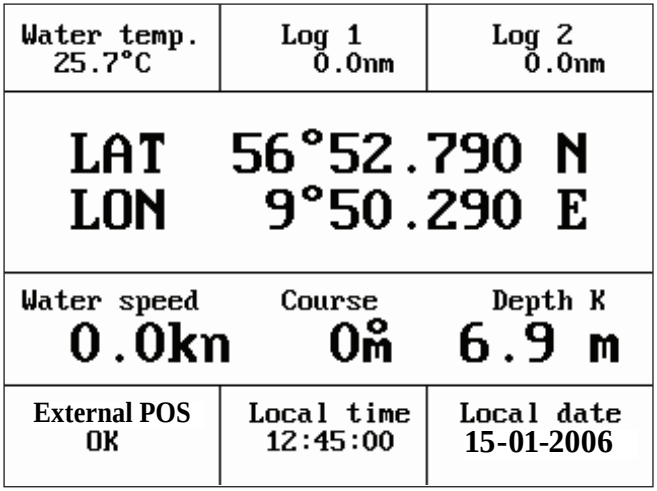
③ XTE alarm lines - an alarm will sound if the ship touches the lines (default distance: 0.10nm).

8.2 Position display

☞ To present a position will require that the echosounder is connected to a navigator (GPS position sensor).

MENU
5,2

Call up the menu bar, and...
load Position display



Trip log 1 and 2.

Position in three decimals in minutes.

Water speed/speed over ground.

Course, magnetic or true.

Position update - if, for some reason, there is no position update from external sensor, the displayed position will start to flash and once normal position update is resumed the flashing will stop.

Position display setup
The general Position setup e.g. Display position as: LAT/LON, Decca or Loran C, etc. is placed in the SETUP menu (section 11.2).

ADJ

From position display, press [ADJ] to load Position display setup:

Go to the function you wish to change

CLR *Reset log*

0-9 *Key in new values, or...*

+/- *Toggle between available values*

ENT *Confirm editing and return to the Position display*

Log - reset log or insert alternative start figure by altering the value in the “Log 1” and/or “Log 2” line. Press [CLR] to reset the figure, and press the numeric keys 0-9 to alter the figure.

Additional data - can be set to DEPTH or COMPASS.
DEPTH will be shown from built-in echosounder.
COMPASS will show heading from connected sensor.

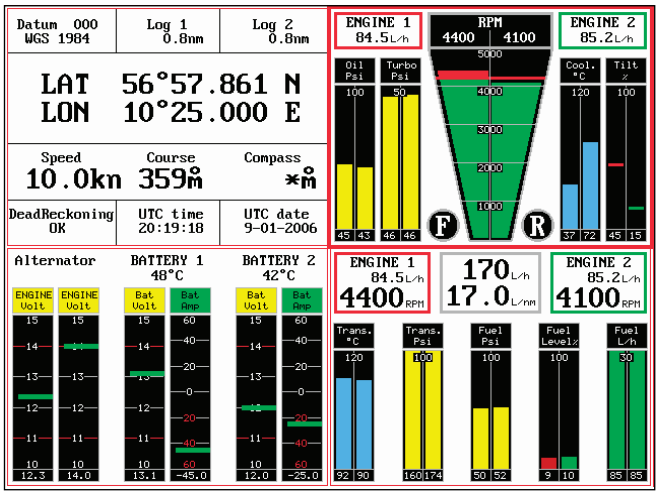
9. Engine menu

5 ENG	
1 Engine status	- see section 9.1
2 Fuel and transmission	- see section 9.2
3 Battery status	- see section 9.3
4 2nd Engine status	- see section 9.4
5 2nd Fuel and transmission	- see section 9.4
6 2nd Battery status	- see section 9.4

This graphical engine monitoring system is available for engines outputting data via NMEA2000® or an appropriate interface device supporting NMEA2000®. Depending on the engine system and interface, some data may not be transmitted on the databus. If not readily available, please contact the engine manufacturer or your local Simrad dealer.

The menu points 4, 5 and 6 are a second set of displays, which only will be visible if the system detected more than two engines on board.

The EQ44-2/EQ54-2 is capable of receiving and presenting various engine data in either full screen or split screen with two or all three data displays on same screen:



For dual engines, the system provides ‘dual bar analog instruments’ to give a precise overview of the rpm synchronization and to make direct comparison of data between the two engines.

The engine monitoring system provides analog graphical gauges and digital (numerical readings) data for up to four engines - see display examples further on in this chapter.

General settings
SimNet will auto detect the engines at start-up and will automatically set up the parameters in default mode. Before using the engine monitor system, you may want to edit the setup to customize the read-out. The top line identifies the engine/battery, the default is ENGINE 1 to 4 or BATTERY 1 to 4. Insert the correct name for the engine/battery in the Interface setup:

MENU
8,3
Call up the menu bar, and...
load the Interface setup

GAIN+
Use the [GAIN+] *key to go to the Engine tab*

Go to the name you wish to change,
- refer to section 11.5 Alphanumeric names

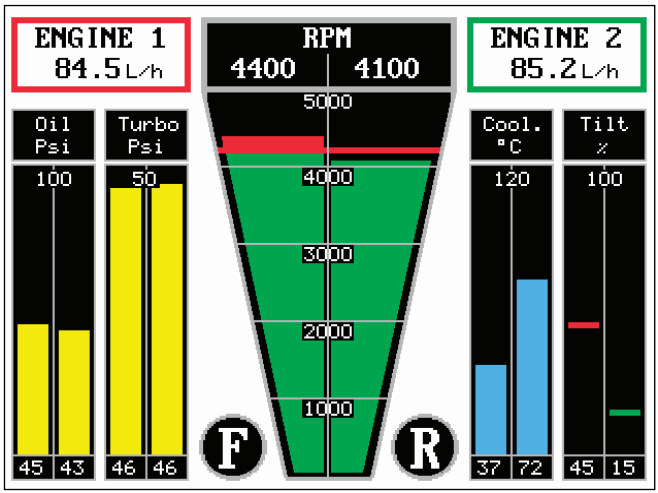
ENT
Confirm entry and exit

☞ To change the measuring units, refer to ‘Setup for units’ in section 11.3.

9.1 Engine status

MENU
6,1

Call up the menu bar, and...
load the Engine status display



Forward Reverse (N = Neutral)

The numbers at the bottom represents Engine 1 to the left and Engine 2 to the right in each column.

The Engine status display will provide data from 1 or 2 engines. If there are more than 2 engines on board (and connected to the system), a second Engine status display is available by pressing: [MENU], [6], [4].

The default ranges in the Engine status display can be viewed and changed as described below, except for **Tilt**, which is read-only information of the exact tilt of the outboard engine in percentage, or of the Stern drive. No range or limitation can be entered.

To change the default settings:

ADJ

Load Engine status setup
- see display example next page.

Left engine source - use +/- to toggle between connected engines.

Right engine source - use +/- to toggle between connected engines.

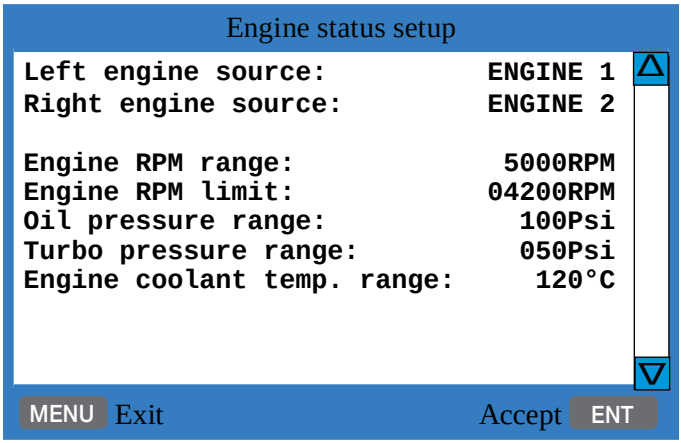
Engine RPM range, default is 5000 RPM. Selectable in steps from 2500 to 12500 by means of the +/- keys.

Engine RPM limit, default is 4200 RPM. To control the limit manually, you can insert a new limit by means of the numerical keys. When the limit is exceeded, the green fill color will turn red.

Oil pressure range, default is 100 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-125 Psi) or Pascal (69-862 kPa).

Turbo pressure range, default is 50 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-125 Psi) or Pascal (69-862 kPa).

Engine coolant temperature range, default is 120 degrees Celcius. Use numerical keys to enter new range. Can be shown in Celcius (40°C to 200°C) or Fahrenheit (104°F to 392°F).

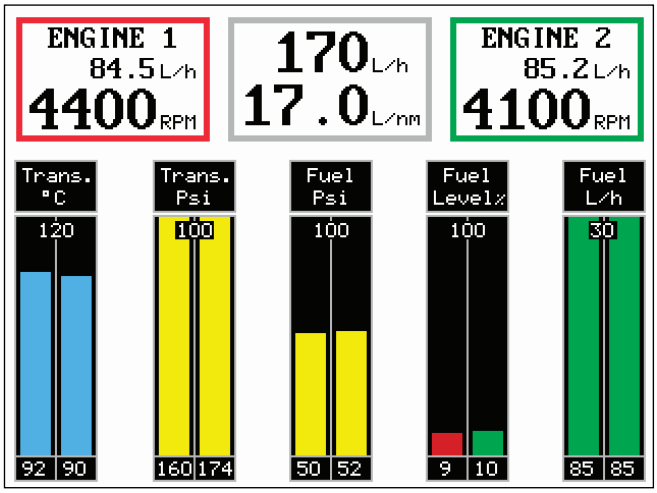


ENT *Confirm entry or exit with* [MENU] *without making any changes*

9.2 Fuel and transmission

The level of fuel is indicated in a percentage of the maximum value, depending on the shape of the fuel tank and the level sensor. This level can either be 'level above tank bottom' or 'remaining volume in tank'. The fill color will be red when reaching < 10 %.

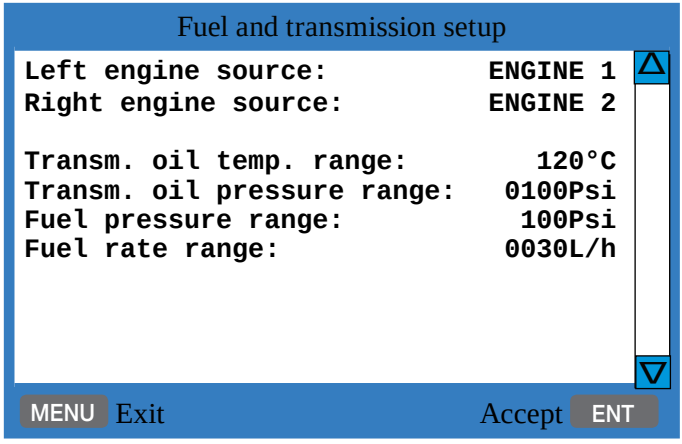
MENU *Call up the menu bar, and...*
6,2 *load the Fuel and transmission display*
- see display example next page.



In the top part of this display you have read-outs for Engine 1 to the left and Engine 2 to the right and a total for both in the middle. The second line in the middle i.e. '17.0 L/nm' - liter per nautical mile, is calculated by the NavStation. The read-out can be presented in L/nm, L/km, L/mi, G/nm, G/km, G/mi. The unit can be selected in [MENU], [8], [1], see section 10.5. The numbers at the bottom represents Engine 1 to the left and Engine 2 to the right in each column.

To change the default settings:

ADJ *Load Fuel and transmission setup*


Fuel and transmission setup
Left engine source: ENGINE 1
Right engine source: ENGINE 2
Transm. oil temp. range: 120°C
Transm. oil pressure range: 0100Psi
Fuel pressure range: 100Psi
Fuel rate range: 0030L/h
MENU Exit
Accept ENT

Left engine source - use +/- to toggle between connected engines.

Right engine source - use +/- to toggle between connected engines.

Transmission oil temperature range, default is 120 degrees Celcius. Use numerical keys to enter new range. Can be shown in Celcius (50°C to 300°C) or Fahrenheit (122°F to 572°F).

Transmission oil pressure range, default is 100 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-500 Psi) or Pascal (69-3447 kPa).

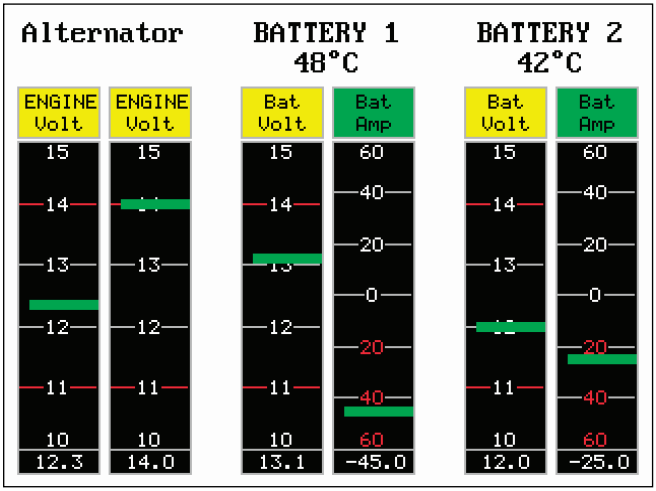
Fuel pressure range, default is 100 Psi. Use numerical keys to enter new range. Can be shown in Psi (10-125 Psi) or Pascal (69-862 kPa).

Fuel rate range, default is 0030 liter per hour. Use numerical keys to enter new range. Can be shown in liter per hour (1-1000 L/h) or gallon per hour (1-264 G/h).

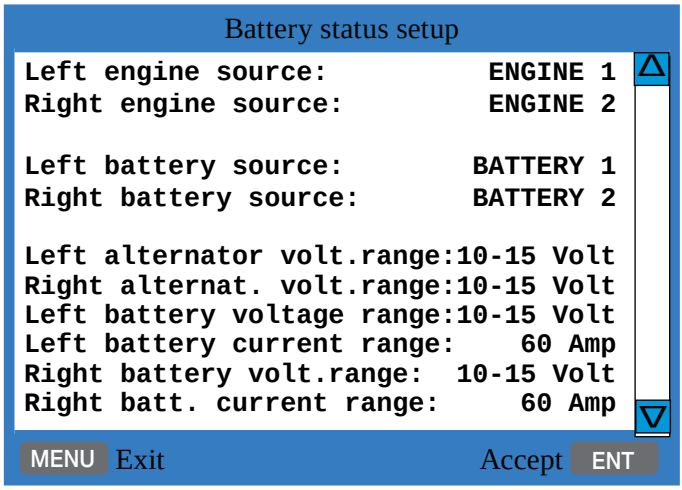
ENT *Confirm entry or exit with* [MENU] *without making any changes*

9.3 Battery status

MENU
6,3 *Call up the menu bar, and...*
load the Battery status display



To change the default ranges:
ADJ *Load Battery status setup*
- see display example next page.


Battery status setup
Left engine source: ENGINE 1
Right engine source: ENGINE 2
Left battery source: BATTERY 1
Right battery source: BATTERY 2
Left alternator volt.range:10-15 Volt
Right alternat. volt.range:10-15 Volt
Left battery voltage range:10-15 Volt
Left battery current range: 60 Amp
Right battery volt.range: 10-15 Volt
Right batt. current range: 60 Amp
MENU Exit
Accept ENT

Left engine source - use +/- to toggle between connected engines.

Right engine source - use +/- to toggle between connected engines.

Left battery source - use +/- to toggle between connected batteries.

Right battery source - use +/- to toggle between connected batteries.

Left alternator voltage range, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

Right alternator voltage range, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

Left battery voltage range, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

Left battery current range, default is 60 Amp. Selectable in steps from 10 to 1000 Amp (use +/- keys).

Right battery voltage range, default is 10-15 Volt. Selectable in steps i.e. 10-15, 20-30 or 26-41 Volt (use +/- keys).

Right battery current range, default is 60 Amp. Selectable in steps from 10 to 1000 Amp (use +/- keys).

ENT *Confirm entry or exit with* [MENU] *without making any changes*

9.4 Second set of engine monitoring displays

The menu points 4, 5 and 6 are a second set of displays, which only will be visible if the system detected more than two engines on board.

MENU
6,4
Call up the menu bar, and...
load the 2nd Engine status display
- refer to section 9.1.

MENU
6,5
Call up the menu bar, and...
load the 2nd Fuel and transmission display
- refer to section 9.2.

MENU
6,6
Call up the menu bar, and...
load the 2nd Battery status display
- refer to section 9.3.

9.5 Demo mode

For the purpose of demonstration, the engine function has a demo mode, which can present static simulated read-outs. To run a demo of the engine monitoring system:

MENU
8,3
Call up the menu bar, and...
load the Interface setup

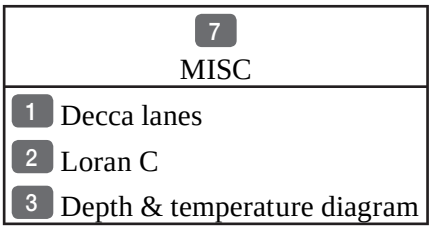
GAIN+
Use the [GAIN+] *key to go to the Engine tab*

Go to the bottom line and toggle the demo mode on and off with +/-

ENT
Confirm entry and exit

☞ Remember to turn off the demo mode again! The monitoring system will not present any actual readings when the demo mode is running.

10. Miscellaneous menu



10.1 Decca lanes

To change the position readouts to decca mode, see section 11.2 under Pilot/Position setup, where 'Display position as' can be toggled to 'Decca'.

MENU *Call up the menu bar, and...*
7,1 *load decca chain display*

ADJ *Open for change*

+/- *Leaf through the available chains* - see next page.

ENT *Confirm entry*

List of decca chains:

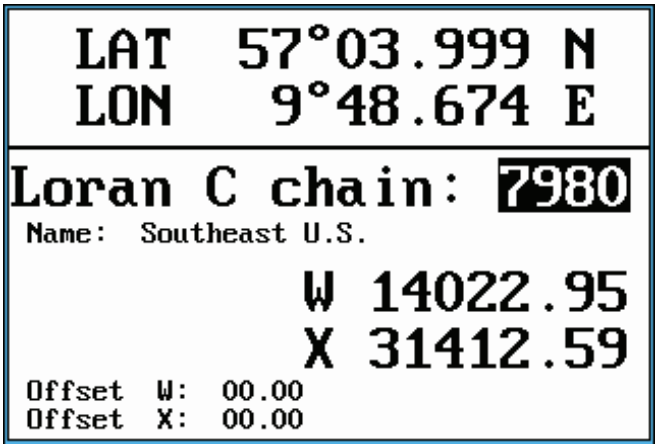
00	S Baltic	0A	24	Skagerak	10B
01	Vestlandet	0E	25	N Persian	5C
02	SW British	1B	26	S Persian	1C
03	North Humber	2A	27	Bombay	7B
04	Holland	2E	28	Calcutta	8B
05	British	3B	29	Bangladesh	6C
06	Lofoten, Norway	3E	30	Hokkaido	9C
07	German	3F	31	Tohoku	6C
08	N Baltic	4B	32	Kyusyu	7C
09	NW Spanish	4C	33	Namaqua	4A
10	Trondelag (N)	4E	34	Cape chain	6A
11	English	5B	35	E Province	8A
12	N Bothnian	5F	36	Dampier	8E
13	S Spanish	6A	37	Port Hedld	4A
14	N Scottish	6C	38	Hokuriku	2C
15	Finland	6E	39	Newfoundld.	2C
16	Danish	7B	40	Cabot strt	6B
17	Irish	7D	41	Nova Scotia	7C
18	Finnmarken	7E	42	Salaya	2F
19	French	8B	43	Kanto	8C
20	S Bothnian	8C	44	SW Africa	9C
21	Hebridean	8E	45	Natal	10C
22	Frisian	9B	46	Shikoku	4C
23	Helgeland	9E			

10.2 Loran C

To change the position readouts to Loran C mode, see section 11.2 under Pilot/Position setup, where 'Display position as' can be toggled to 'Loran C'.

MENU *Call up the menu bar, and...*
7,2 *load Loran C chain display*

ADJ *Open for change*



+/- *Leaf through the available chains* - see listing next page.

If required, go to the slaves, and...

+/- *Toggle between available slaves* (not all chains have more than one slave)

0-9 *...and it is possible to alter the figures in the time delay*

If required, go to Offset, and key in a positive or negative offset

0-9 *Key in a positive or negative offset to the time delay (toggle positive/ negative with +/-)*

ENT *Confirm entry*

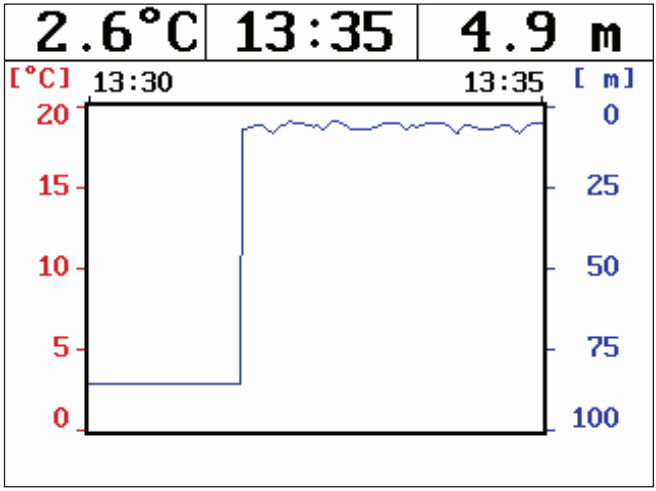
List of Loran C chains:

Central Pacific	4990	Commando Lion	5970
Gulf of Alaska	7960	North West Pacific	9970
Southeast U.S.	7980	Norwegian Sea	7970
Great Lakes	8970	Mediterranean Sea	7990
Northeast U.S.	9960	Icelandic	9980
Canadian West Coast	5990	Saudi Arabia South	7170
Canadian East Coast	5930	Saudi Arabia North	8990
Labrador Sea	7930	Eastern U.S.S.R.	7950
West Coast U.S.	9940	Western U.S.S.R.	8000
North Pacific	9990		

10.3 Depth & temperature diagram

MENU
7,3

Call up the menu bar, and...
activate Depth & temperature diagram



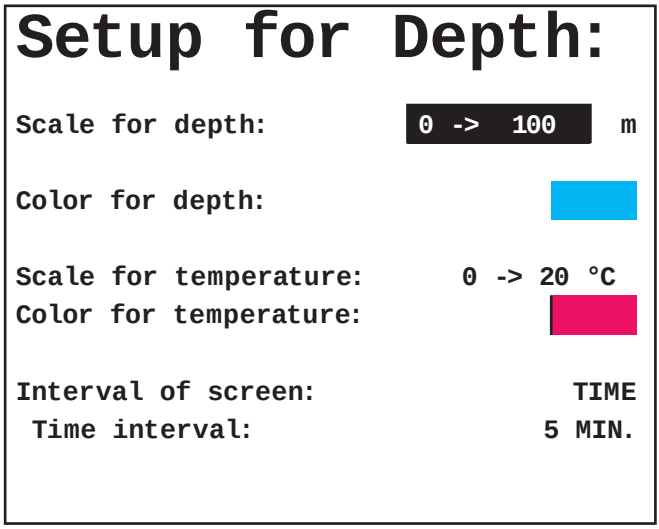
Present water temperature and depth.

Depth over time or distance.

Temperature over time or distance.

ADJ

Call Setup for Depth



Go to the function you wish to change

0-9 *Key in new figures, or...*
+/- *change settings*

ENT *Confirm changes*

Scale for depth - there are six depth scales to choose from, ranging from 0 -> 10m to 0 -> 3000m. Toggle between values with +/- keys.

Color - for depth and temperature can be changed. Toggle between available colors by means of the +/- keys.

Scale for temperature - can be set to 0 -> 10°, 0 -> 20°, 0 -> 30°, 10 -> 20°, and -10 -> 10°.

Interval of screen - the interval for updating of screen can be related to TIME or DISTANCE.
TIME interval can be set in 6 intervals from 5 minutes to 3 hours (+ freeze) for refreshing of the screen.
DISTANCE can be set in 7 intervals, ranging from 0.5nm to 90nm in order to adjust to the speed of the ship, and you can freeze the reading.

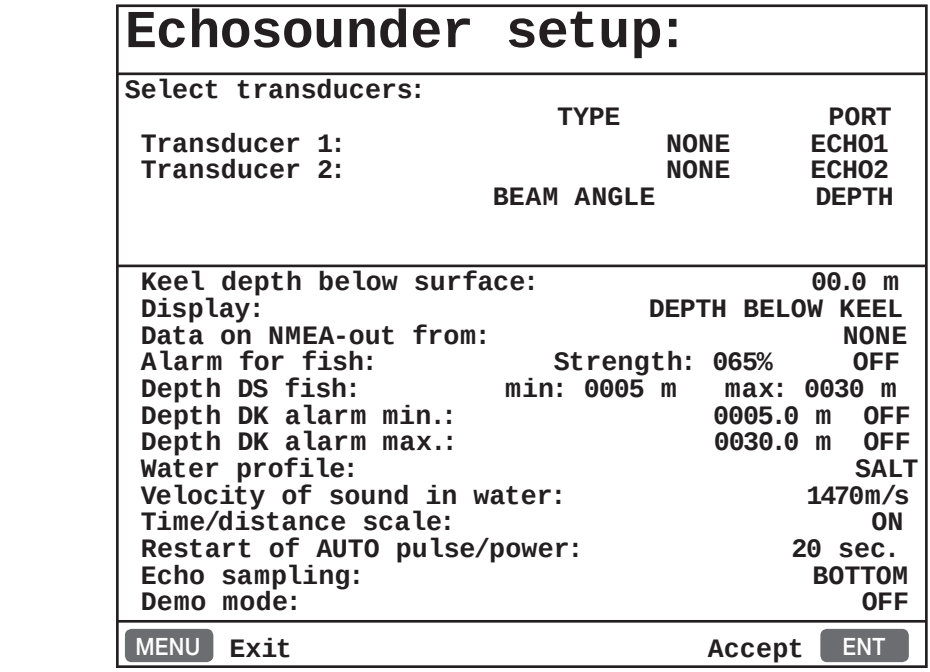
11. Setup menu

8 SETUP	
STND Echosounder setup	- see section 11.1
1 Pilot/Position setup	- see section 11.2
2 Speed alarm, units & language	- see section 11.3
3 Interface setup	- see section 11.4
4 Palette setup	- see section 11.5
5 Factory settings	- see section 11.6
6 QuickGuide	- see section 11.7

11.1 Echosounder setup

The Echosounder setup display mainly consist of general settings, but also applies to a specific frequency where stated. The EQXX features single and dual transceiver transmitting at 38, 50 and 200 kHz.

MENU *Call up the menu bar, and...*
8 *open the SETUP menu, and...*
STND *load Echosounder setup display* - see display example next page.


Echosounder setup:
Select transducers:
TYPE PORT
Transducer 1: NONE ECHO1
Transducer 2: NONE ECHO2
BEAM ANGLE DEPTH
Keel depth below surface: 00.0 m
Display: DEPTH BELOW KEEL
Data on NMEA-out from: NONE
Alarm for fish: Strength: 065% OFF
Depth DS fish: min: 0005 m max: 0030 m
Depth DK alarm min.: 0005.0 m OFF
Depth DK alarm max.: 0030.0 m OFF
Water profile: SALT
Velocity of sound in water: 1470m/s
Time/distance scale: ON
Restart of AUTO pulse/power: 20 sec.
Echo sampling: BOTTOM
Demo mode: OFF
MENU Exit
Accept ENT

Use the cursor key to move cursor around in the display

+/- *Select new values by means of the +/- keys*

ENT *Confirm changes, or...*

MENU *Abandon changes and exit display*

Transducer - select transducer type. Insert the depth (position) of the transducer below surface.

Display can show: DEPTH BELOW KEEL / SURFACE / TRANSDUCER.

Data on NMEA-out from - select the frequency you wish to use for transfer of data to connected navigator, plotter, etc.

Alarm for fish - set the strength from min. 000 (weak echo) to max. 099% (strong echo), and you can set it ON or OFF.

Depth DS fish - define a specific area below the water surface of minimum and maximum depth for the fish alarm.

Depth DK alarm min. and max. - set up a depth limit alarm for depth below keel.

Water profile - choose between SALT and FRESH water. The setting will reflect on the:

Velocity of sound in water: SALT = 1470 meters per second and FRESH = 1430 meters per second as standard. The standard settings can be even more accurate by slightly increasing the number of meters in warm waters and decreasing in cold waters.

Time/distance scale - will indicate the elapsed time or distance for the echo picture. The readout will appear in the upper part of the echo display. Toggle between time and distance in “Scroll synchronisation”, section 4.7.

Restart of AUTO pulse/power - will automatically restart the echosounder if bottom detection has been lost for the chosen time interval i.e. 10, 20 or 40 seconds. The AUTO pulse and power will restart from 10W and SHORT pulse.

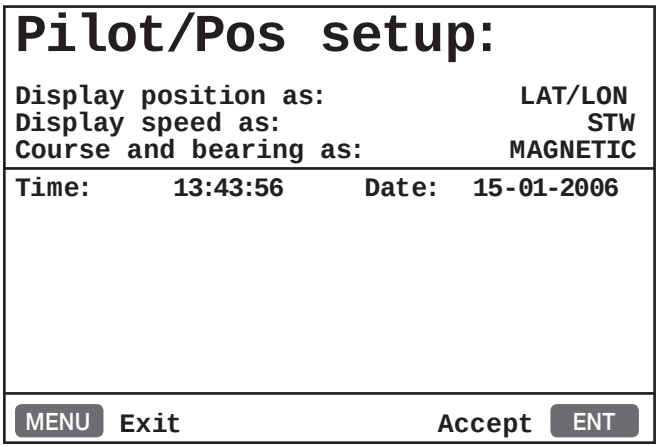
Echo sampling - is preset to BOTTOM, which enables auto range and a view all the way to the bottom. For vessels moving at high speed with the risc of losing bottom detection, RANGE or a max. depth setting (50 to 2000m) is recommended. The unit will not wait for a bottom echo, but transmit a new pulse as soon as the selected range has been reached. Auto range is automatically switched off. The depth alarm setting will have a higher priority than the selected depth range.

Demo mode - the echosounder will function as though a transducer was connected, but all data presented in the display will be simulated.

11.2 Pilot / Position setup

MENU
8,1

Call up the menu bar, and...
load Pilot/Position setup display



Go to the function you wish to change

0-9
+/-

Key in new values, or...
Toggle between available values

ENT

Confirm editing

Display position as - the position can be shown in latitude/ longitude, Loran C or decca coordinates (after selecting chain from the Miscellaneous menu). Toggle with +/-.

Display speed as - SOG Speed Over Ground or STW Speed Through Water. Toggle with +/-.

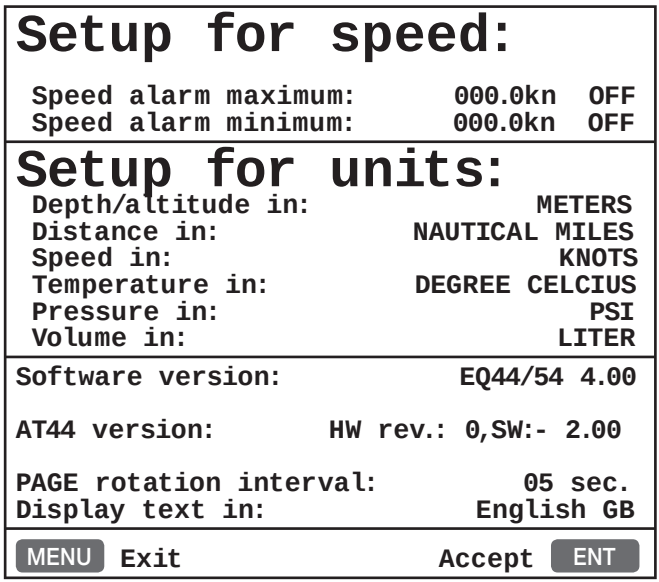
☞ To receive STW information will require connection of external instrument via the SimNet system or the NMEA port.

Course and bearing as - readings of course and bearing can be made in either MAGNETIC or TRUE. Toggle with +/-.

Time - correct actual time and date by means of the numeric keys.

11.3 Speed alarm, units & language

MENU *Call up the menu bar, and...*
8,2 *load Speed alarm, units & language display*



Scroll up/down to go to the function you wish to change

0-9 *Key in new values, or...*

+/- *Toggle between available values*

ENT *Confirm changes, or...*

MENU *exit function without making any changes*

Speed alarm - can be set to maximum and/or minimum cruising speed. This may be handy for trawl fishing, entering harbors with speed limits, etc.

☞ Press [CLR] to reset an alarm - this applies to all activated alarms in the system.

Depth / altitude in - can be set to meters (m), feet (ft), fathoms (fm) or Italian unit: Passi braccio (Pb).

Distance in - can be calculated in nautical miles (nm), kilometers (km) or statute miles (mi).

Speed in - can be shown in knots (kn), kilometers/hour (kh) or miles/hour (mh).

Pressure in - can be shown in Psi or Pascal (kPa).

Volume in - can be shown in liter or gallon.

Software version - indicates which software version is installed in the unit.

AT44 version - indicates if an AT44 SimNet converter is connected and which revision hardware and software is implemented.

PAGE rotation interval - can be set to anywhere between 03 to 99 seconds. Refer to “Fundamentals of the display and page system” in section 2.1 for more details on how the function works.

Display text in - as standard the EQXX is supplied with the following national display languages: Danish (DK), English* (GB) or (US), French (F), German (D), Italian (I), Dutch (NL), Spanish (E), Swedish (S), and Portuguese (P).

*) The difference from GB English to US English is: Celcius is changed to Fahrenheit, meters is changed to feet, and the date presentation is changed from dd.mm.yy to mm.dd.yy.

11.4 Interface setup

EQ44-2/EQ54-2 has two NMEA in/out ports:
1. NMEA1 is a standard NMEA0183 port.
2. NMEA2 is used for connection to SimNet or NMEA2000 via AT44 Active Tee or for standard NMEA interfacing.

Plug-and-play: SimNet offers easy and uncomplicated interfacing with a unique cable and plug solution and automatic system setup. SimNet is the optimum solution for integrating SimNet products and other products with NMEA 2000.

Group selection or stand-alone: Main products, e.g. MultiRadar, Chartplotter and Autopilot will automatically select the optimum sources for position, heading, depth, speed etc. for all other SimNet products connected. This means that if two Chartplotters are connected, they will both use position data from the same GPS and heading from the same compass. If you wish to use the built-in GPS, also on the Chartplotter, which automatically was set to operate with an external position, you can change the Group selection from SIMRAD to STAND-ALONE.

Multi source: If a main product recognizes e.g. two heading devices it will automatically select a gyro compass before a fluxgate compass, and DGPS before GPS.

NMEA 0183 input: If there is no data available from the SimNet bus for e.g. heading, position or depth, the system will automatically look for data via the NMEA 0183 port.

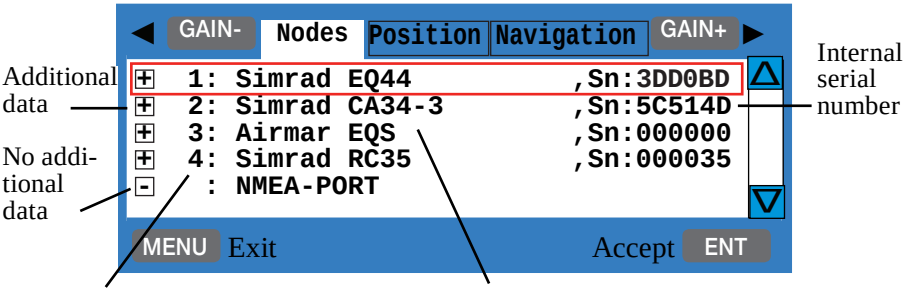
The next pages show examples of interface settings, which are divided into the following groups:
Nodes - Position - Navigation - Water - Compass - Engine - Alarm - SimNet diagnostic - SimNet input - SimNet output - NMEA0183 input - NMEA0183 output - Identification.

MENU
8,3

Call up the menu bar, and...
load interface setup - see display example next page.

Searching interface channels for valid sources and data. Please wait till the first page appears on the screen which will show the nodes

(products) operating on the SimNet bus. See below example:



Move the cursor up/down to select one of the listed products

+ *Press the* [+] *key to access additional data*

Example:

- **EQ44 ECHO SOUNDER**
- **SimNet number=3DD0BD, Address: 1**
- **Device: class = 60, function = 130**
- **Instance: system = 0, device = 0**
- **SimNet:Compatible=YES,Ver= 1.000 E**
- **Ver.: NMEA2000 = 1.004, SW = 03.00**
- **Product code=031B,Unique no=137FFF**

The name **ECHO SOUNDER** can be user defined - see the Identification interface (last tab).

\- *Press the* [-] *key to hide additional data*

General information: Go to the next interface by pressing [GAIN+] and step back to the previous interface by pressing [GAIN-].
Use the cursor key to move around in the display and toggle between available settings and sentences with the +/- keys.

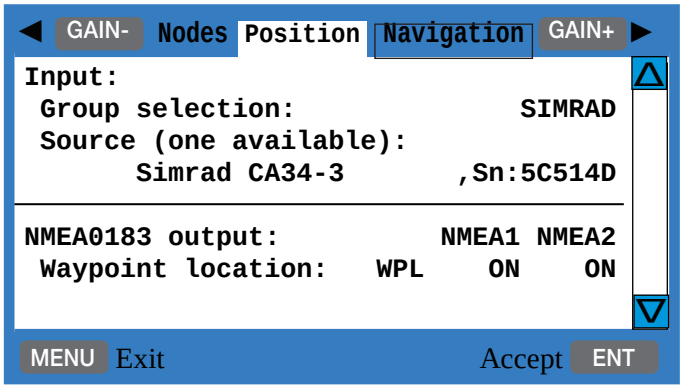
ENT *Confirm editing, or...*

MENU *exit function without making any changes*

Group selection can be set to:
SIMRAD - auto-selected SimNet units from the Simrad group.
STAND-ALONE - manually selected data source and third party units.

Source: - depending on which products (sources) are connected, the legend will indicate: 'none available', 'one available', 'multiple available' or 'owned, data type locked'.

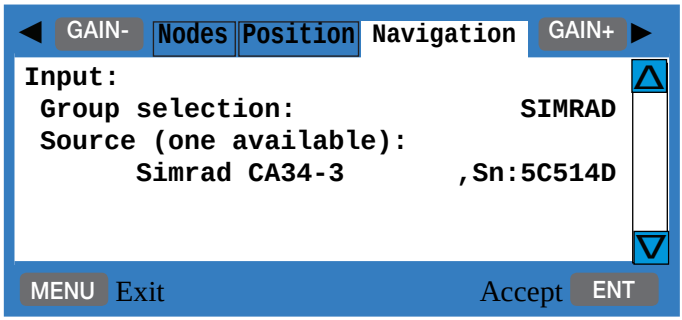
GAIN+ *Go to Position interface* - step back with [GAIN-]



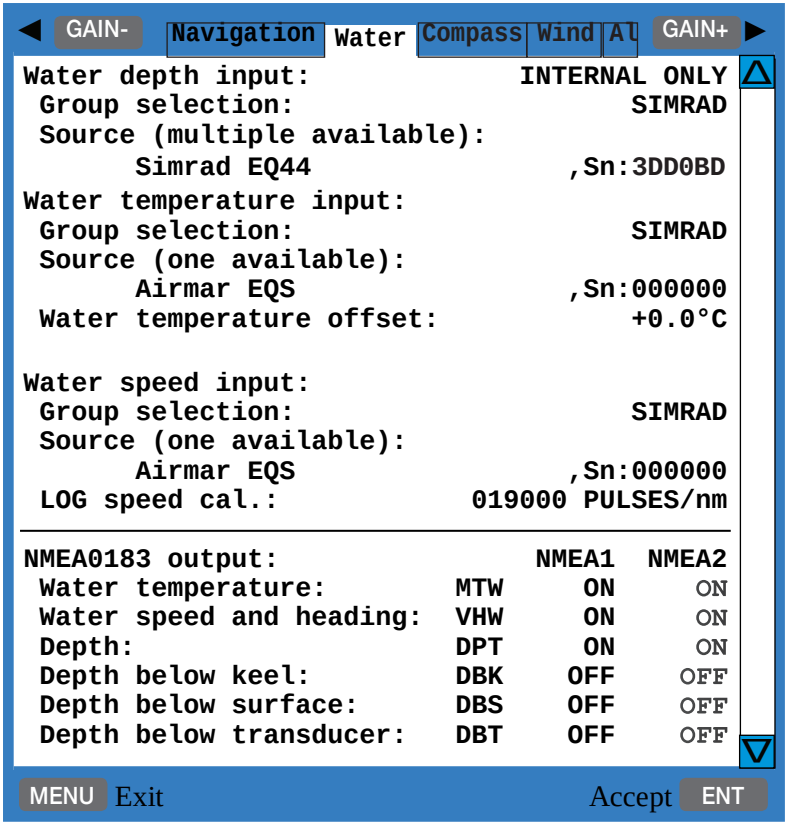
Waypoint location - see section 4.6.

NMEA0183 output - see also section 11.4.1 Description of sentences.

GAIN+ *Go to Navigation interface* - step back with [GAIN-]



GAIN+ *Go to Water interface* - step back with [GAIN-]



Input: INTERNAL ONLY - indicates that no external source can be selected for depth.

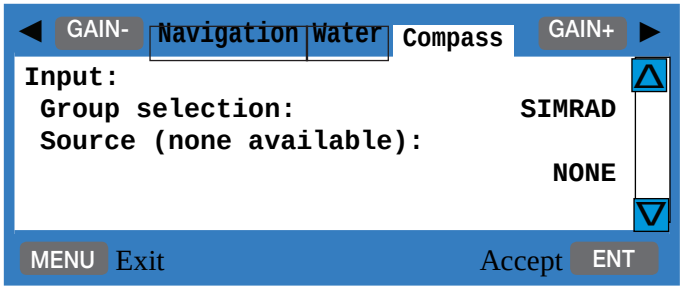
Water temperature offset - a figure can be keyed in to compensate for differencies in temperature sensor.

LOG speed calibration - the unit is preset to receive 19000 pulses per nautical mile from the log transducer (paddle wheel). However the figure might have to be changed to compensate for various transducers and actual water flow passing the transducer. The correct pulse rate is calculated by:

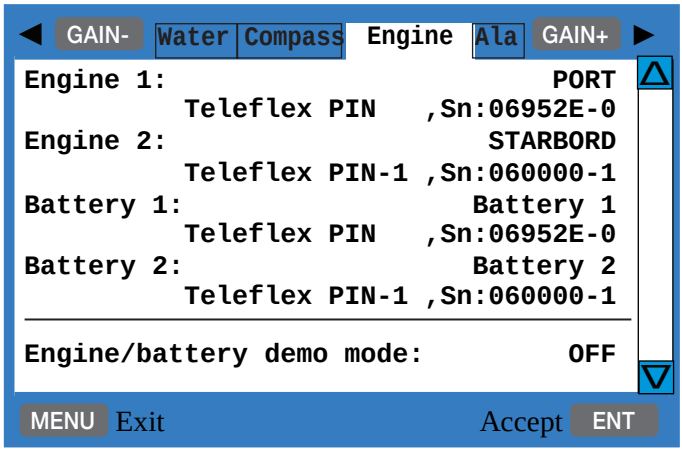
$$\frac{\text{19000 x indicated speed (e.g. 4kn)}}{\text{actual speed (GPS) (e.g. 5kn)}} = 15.200 \text{ pulses/nm}$$

NMEA0183 output - see also section 11.4.1 Description of sentences.

GAIN+ *Go to Compass interface* - step back with [GAIN-]



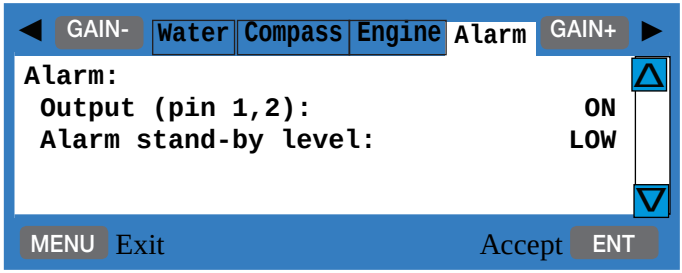
GAIN+ *Go to Engine interface* - step back with [GAIN-]



PIN - Propulsion system (Engine interface).
To run a demo of the engine/battery monitoring system, use the cursor to go to OFF and use the +/- key to toggle to ON. When ready to connect the **real** system, be sure to turn off the demo mode again.

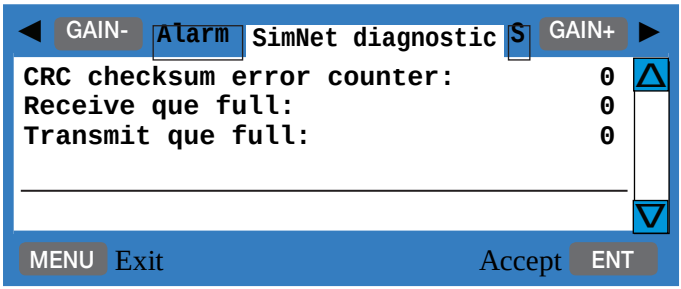
NMEA2000® output - see section 11.4.2 Description of sentences.

GAIN+ *Go to Alarm interface* - step back with [GAIN-]



Stand-by level can either be: LOW = 0 volt or HIGH = 5 volt.

GAIN+ *Go to SimNet diagnostic interface* - step back with [GAIN-]



CRC checksum error counter - if the figure is not 0 it could be due to a number of things and not necessarily that there is a system error. However, if the counter is active and the number is rapidly increasing, then the system has detected a fault.
For instance, if the SimNet cable is pulled, the counter will be activated and once the cable is back in place, the counter will stop, but will stay at the figure it has reached. So therefore, a figure other than 0 does not necessarily mean that something is wrong, only if the figure continues to increase.

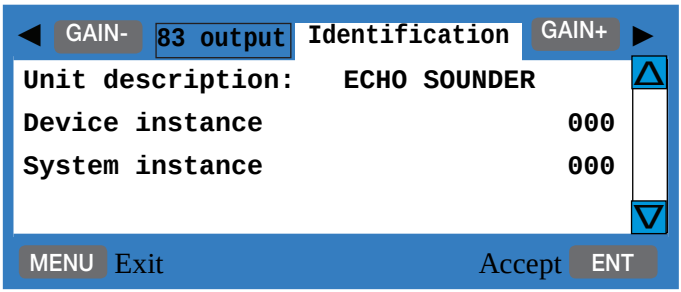
Prior to call for technical assistance:
1. Check connected cabling.
2. Check supply voltage to be between 11.8-15 VDC to the SimNet system.
3. Systematically disconnect one unit at a time to see which one is causing the problem. Start at the opposite end of the 12V power supply.

The two last lines in the SimNet diagnostic interface are for technicians only.

GAIN+ *Go to the next interface* - step back with [GAIN-]

The interfaces: SimNet input, SimNet output, NMEA0183 input and NMEA0183 output are for technicians only.

GAIN+ *Go to the next and last interface: Identification* - step back with [GAIN-]



Unit description - can be customized to read e.g. BACK-UP UNIT. Maximum number of characters is 16.

The identification name can be seen in the Nodes interface - refer to the beginning of this section.

ENT *Confirm editing, or...*

MENU *exit function without making any changes*

11.4.1 Description of NMEA0183 version 3.0 sentences

Description of output sentences
MTW Water temperature
VHW Water speed and heading.
DBS Depth below surface.
DBK Depth below keel.
DBT Depth below transducer.
DPT Depth, including offset.
WPL Waypoint location

Description of input sentences
MTW Water temperature.
VHW Water speed and heading.
GLL Geographic position, latitude/longitude.
RMA Recommended minimum specific Loran C data.
RMC Recommended minimum specific GPS data.
GGA Global Positioning System fix data.
VTG Track made good (course) and ground speed.

Description of navigation input sentences
APB Autopilot sentence “B”.
RMB Recommended minimum navigation information.
XTE Cross-Track-Error, measured.

11.4.2 Description of NMEA2000® sentences

PGN name	PGN	Data content	Indication on display
Battery status	127508	Battery instance, Battery potential, Battery current, Battery case temperature	Free name tag related to instance no. Default is: Battery 1, 2, 3, 4 Bat Volt Bat Amp *.*°C or °F
Engine parameters, Rapid update	127488	Engine instance, Engine speed, Engine boost pressure (Turbo)	Free name tag related to instance no. Default is: Engine 1, 2, 3, 4 RPM Turbo Psi or kPa
Engine parameters, Dynamic	127489	Engine instance, Engine oil pressure, Engine coolant temp. Alternator potential Fuel rate Fuel pressure Engine tilt/trim	See above. Oil Psi or kPa Coolnt °C or °F Engine name tag Volt Fuel G/h or L/h and per nm* Fuel Psi or kPa Tilt %
Transmission Parameters, Dynamic	127493	Transmission instance Transmission gear (F,N,R) Transmission oil pressure Transmission oil temp.	Follows name tag and instance of engine. **F**orward, **R**everse or **N**eutral Transm Psi or kPa Transm °C or °F
Fluid Level	127505	Fluid instance Fluid type (Fuel) Fluid level (0-100%)	Follows name tag and instance of engine. Fuel Level %

*) Calculated on the basis of GPS SOG and ‘gallons per hour’ input.

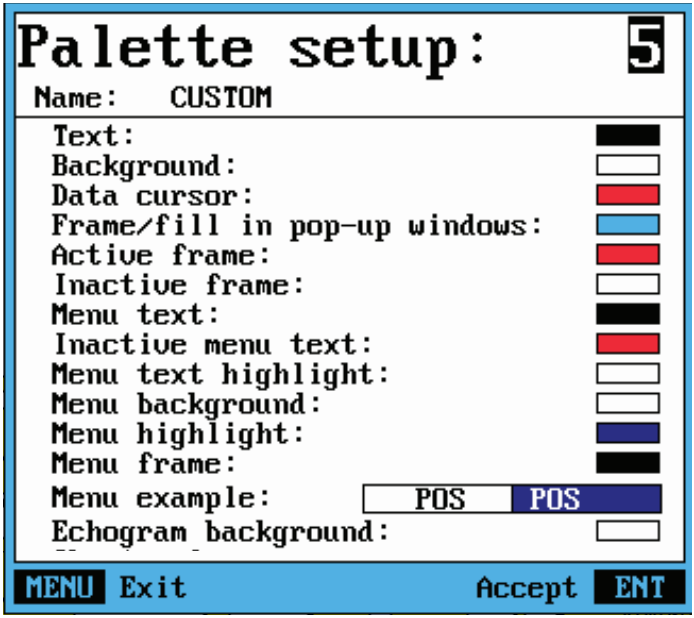
11.5 Palette setup

☞ Quick change of preset color palettes via the [PWR] key.

MENU *Call up the menu bar, and...*
8,4 *load the Palette setup*

Palette 1 to 4 are preset to 1:Bright (sunshine), 2:Day (normal daylight), 3:Dusk and 4:Night settings. These four setups are not adjustable. Palette 9:Multi is preset with multi colors. Palette 5 to 8 can be customized to suit individual needs and wishes. If you wish to make your own special palette setup in e.g. palette 5, then:

5 *Select Palette setup: 5*



Use cursor to scroll up/down in display

A-Z *Key in a name for the new palette setup* - max. 29 characters, -refer to “Alphanumeric names” next page.

+/- *Toggle between available color settings*

ENT *Confirm new setup*

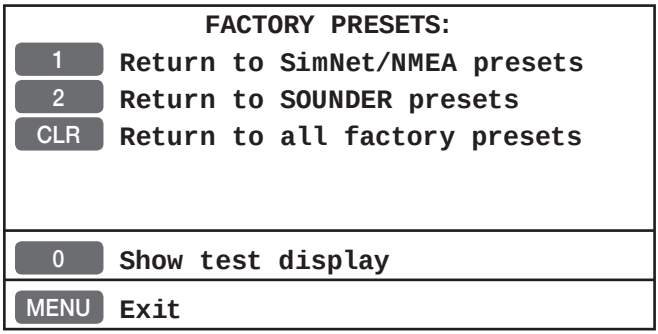
Alphanumeric names:
First select the key with the desired letter, then you can either repeat the keystrokes, which will toggle between e.g. A,B,C,1, or once you have selected one letter you can go back and forth in the alphabet by means of the +/- keys. Use the cursor key to go to next space or to go back one space if you make a mistake.
Depending on the selected language, the 0 (zero) key will hold special characters e.g. Æ Ø Å Ä Ö Ü Ñ, and the 9 (nine) key will hold: (empty space) . -
Press the [CLR] key to delete everything from cursor position and to the right of cursor in that row.

11.6 Factory settings

DELETE MEMORY: It will be possible to erase all sounder settings or SimNet/NMEA settings entered into the unit by the user, and return to the default settings set up from the factory.

FACTORY PRESETS: If the unit is still 'alive' but has ceased to respond to normal operation, it could become necessary to return to the factory presets - but first check 'Troubleshooting' in section 12.9.

MENU *Call up the menu bar, and...*
8,5 *activate the display for Factory settings*



To activate any of the functions, please follow the instructions in the display. However, any attempt to make any type of change, will first of all generate a WARNING display to inform you that you are about to erase some or all data/settings.

ENT If you are absolutely sure, *press* [ENT] *to complete the job, or...*

MENU If not absolutely sure, *press* [MENU] *to exit function without having made any changes*

☞ Activating 'Return to all factory presets' will erase all user-made settings and restore the basic default settings from the factory. The unit will restart with 'Automatic input source setup' as described in section 2.5 Initial start-up.

☞ Activating 'Return to SimNet/NMEA presets' will give two choices:

Press [1] Product SimNet reset
Reset this unit only

Will bring this unit only back to factory defaults of the Interface setup. The unit will restart with 'Automatic input source setup' as described in section 2.5 Initial start-up.

Press [2] Global SimNet reset
Reset entire Simrad group
on the network

Will bring this unit together with all connected units (which are not turned off at the moment) back to factory defaults of the Interface setup. The units will restart with 'Automatic input source setup' as described in section 2.5 Initial start-up.

Show test display:
Information in this display is for technicians only.

POWER OFF - RESET
In case, for some reason, the unit is totally locked i.e. no immediate response from the keypad, then first try to reset the unit by disconnecting the power supply. Reconnect the power cable and then start up the unit again by presssing and holding the [PWR] key until a picture appears on the screen.

MASTER RESET (will return all settings to factory presets)
If the Power off - reset does not solve the problem, you may have to perform a **master reset** by disconnecting the power supply, and then while reconnecting the power cable you will have to press the [PWR] and [CLR] keys at the same time, and hold both keys depressed until a picture appears on the screen. All user-made data will be erased, and all settings are returned to factory presets.

11.7 QuickGuide

A description of the key functions and general guidance is available in a QuickGuide, which can be accessed either at start-up display - press [PAGE], or via the menu:

MENU
8,6
Call up the menu bar, and... activate the QuickGuide

PAGE
Leaf through the information/help text in the PAGE system, General, ECHO, Owner's setup, and Connectors

MENU
Exit QuickGuide

12. Installation and service

12.1 Installation notes

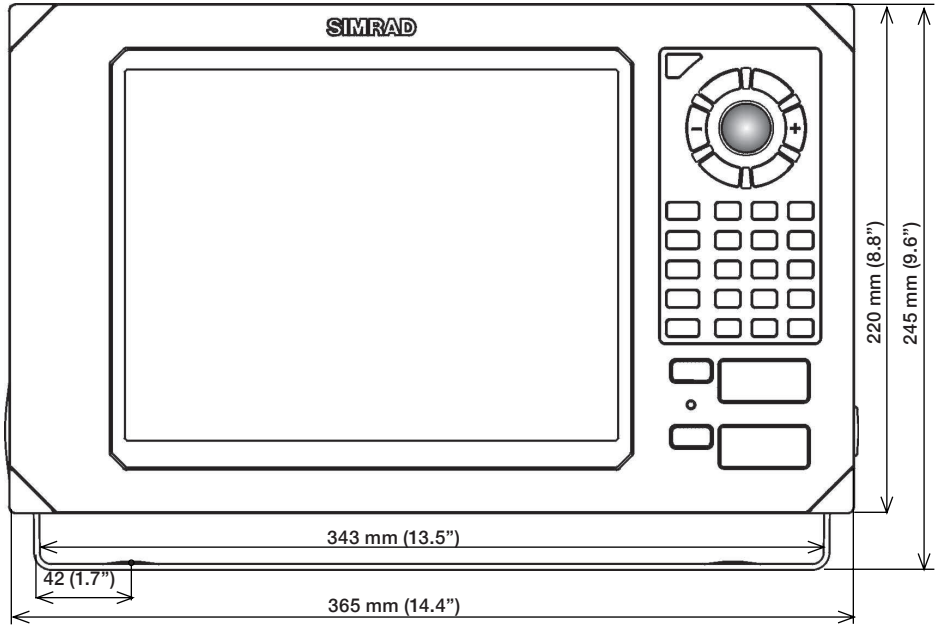
For a number of reasons, all user-related decisions, setups, etc. should be noted in these two pages as they occur. This information may be helpful if your unit has been updated with new software, reset or in for service.

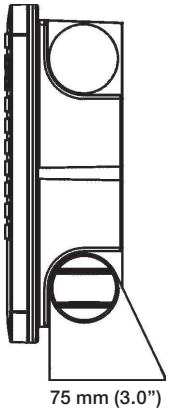
Echo setup	
Transducer	
Depth	
Frequency	
Keel depth	

Other important settings:		

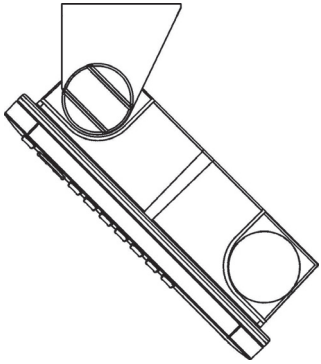
12.2 Installation of EQ44-2

The unit can be flat or bracket mounted - overhead, bulkhead or console.

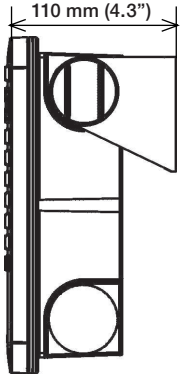




Console mounting.

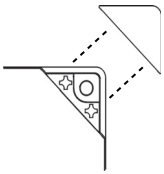


Overhead mounting.

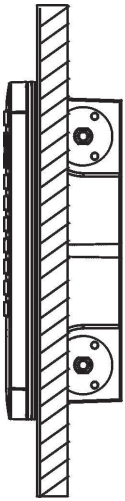


Bulkhead mounting.

Flush mounting of EQ44-2

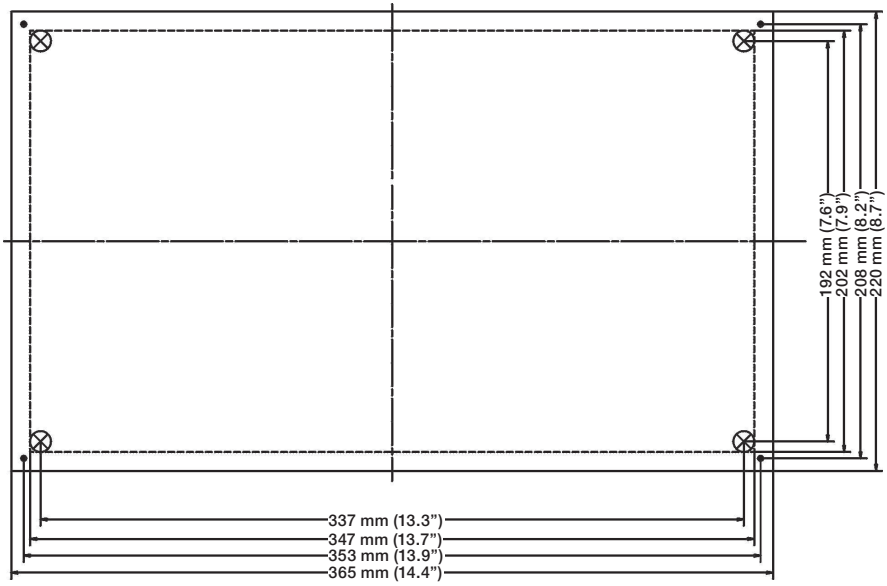


Removable corner
for flush mounting.



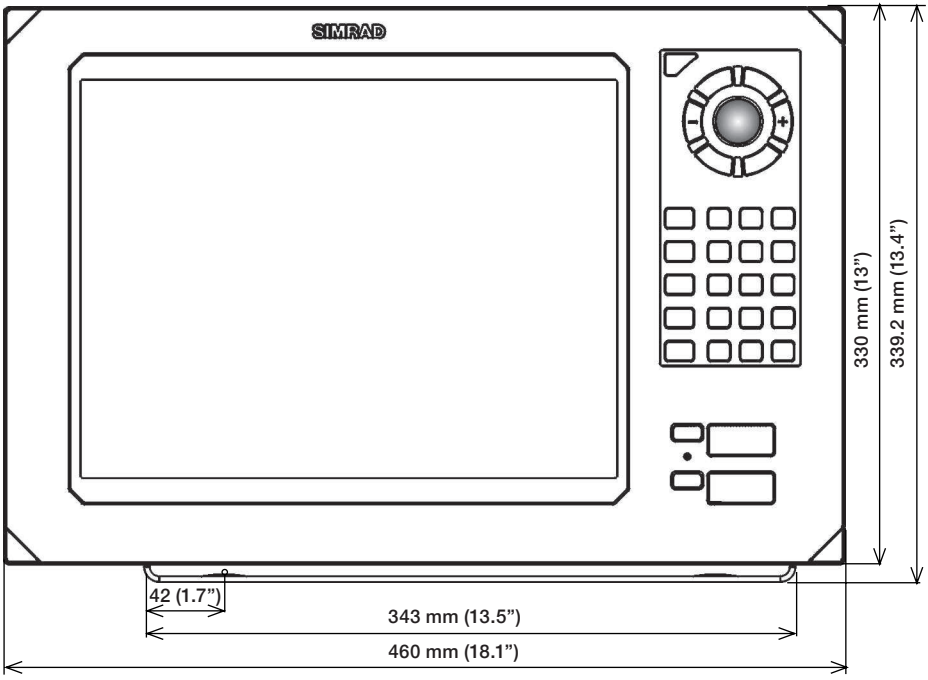
Minimum clearance
incl. cables: 11 cm.

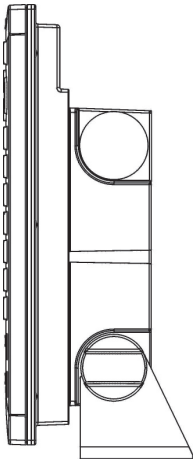
Refer to included template for instructions on flush mounting.



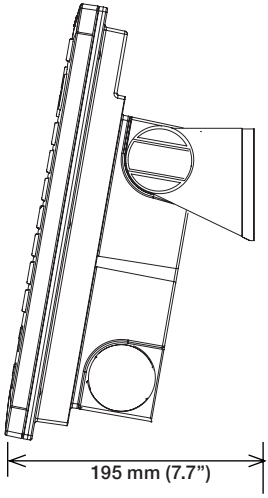
12.3 Installation of EQ54-2

The unit can be flat or bracket mounted. Overhead and bulkhead mounting is only possible if using a distance piece.



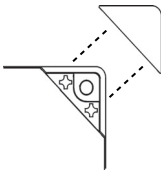


Console mounting.

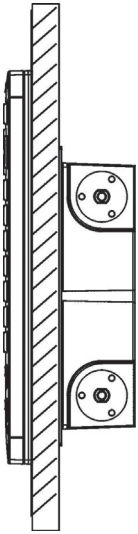


Bulkhead mounting.

Flush mounting of EQ54-2

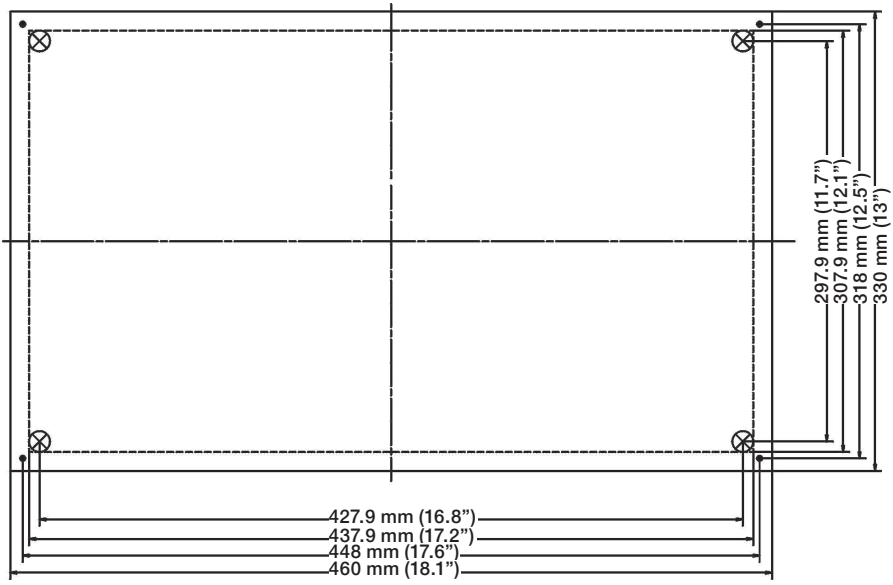


Removable corner
for flush mounting.



Minimum clearance
incl. cables: 13 cm.

Refer to included template for instructions on flush mounting.

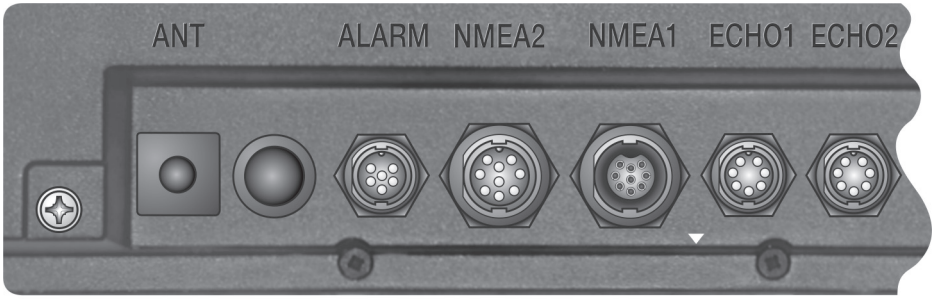


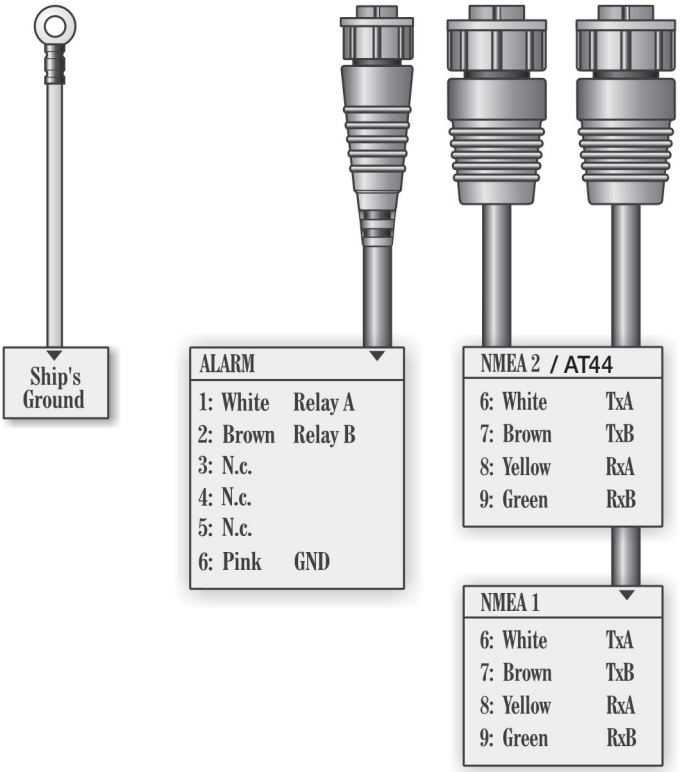
12.4 Location for display unit

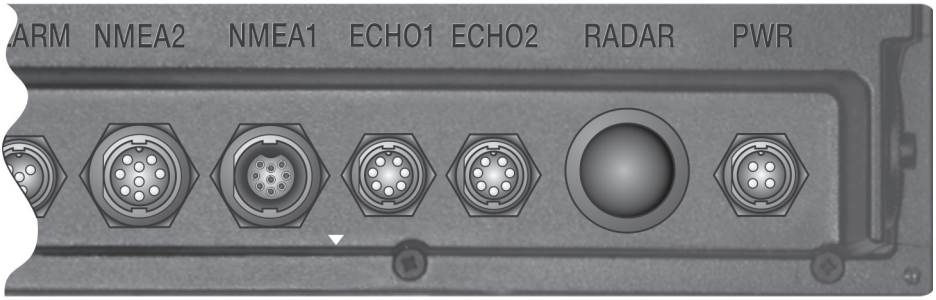
Determine which place is the most suitable and convenient for navigation and general operation after considering the following conditions:

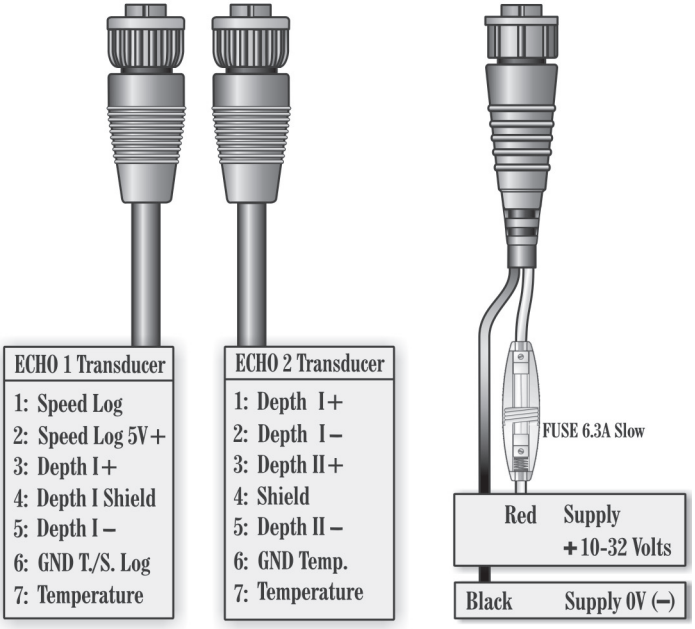
- you can see the ship's bow when you raise or lower your eyes from the display.
- there is limited exposure to direct sunlight to avoid overheating - see environment temperature limits in 12.10 Specifications.
- there is good ventilation and minimum vibration.
- the minimum distance to a magnetic compass is 650mm (25.6").
- provide sufficient space behind the unit to allow for proper cable connections to the rear panel connectors.

12.5 Electrical connections









1: NC
2: NC
3: Black
4: Red w/fuse

12.5.1 Power supply connections

The internal voltage regulator will allow the EQXX to operate normally within the power supply voltage range from 10 to 32 V DC. The EQXX is connected to external power (battery) by means of the supplied power cable, which is approximately 2 meters long and is not extendable. After connecting the cable to the power source, push the plug as far as it will go into the four pin receptacle marked “PWR” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it makes a click.

12.5.2 Fuse

Warning! A fuse should always be installed to protect the unit.
Using a fuse which is not specified for your equipment can cause it to blow the instant the EQXX is switched on or it will not protect the equipment as intended – see fuse rating in section 12.10 Specifications.

12.5.3 Transducer connection

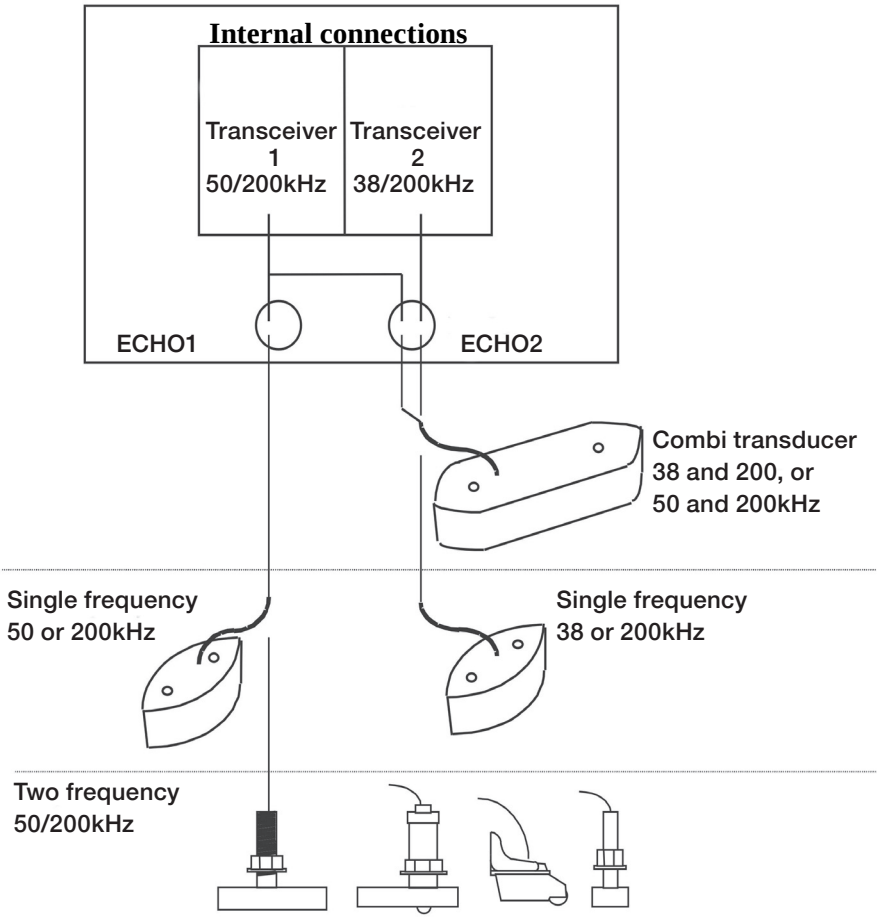
Most transducers are supplied with a 10 meter cable for connection to the echosounder unit – EQXX. Push the female plug, as far as it goes, into the receptacle marked “ECHO1” or/and “ECHO2” on the rear of the cabinet and turn the plug’s coupling ring clockwise until it clicks into locked position
☞ The EQXX must be turned off while connecting/disconnecting the transducer cables.

Recommended connection and setup of Simrad supplied transducers:

Transducer type	Port	Echosounder setup
Simrad C38/200	ECHO2	Simrad Combi 38&200
Simrad C50/200	ECHO2	Simrad Combi 50&200
Low power (100W) combi 38/200	ECHO2	Special Combi 38&200
Airmar B250, B260	ECHO2	Airmar Combi 50&200
Airmar P319, P52, P66, B117, B45, SS505, B744V, B256	ECHO1	Airmar 50 (/200) kHz Airmar 200 (/50) kHz
Unspecified 38/50/200 kHz	ECHO1	USER 38/50/200 kHz

☞ See Transducer connections next page, and Echosounder setup in section 11.1.

Transducer connections:



⚠ Warning!

Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port “ECHO2”. To avoid accidental connection, “ECHO2” is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

12.5.4 Interface connection

The 44 and 54 series feature three possibilities for interconnection and data sharing:

1. SimNet, which is recommended for control and data sharing between Simrad SimNet products.

2. NMEA2000, SimNet products will interface and share data with NMEA2000 based products.

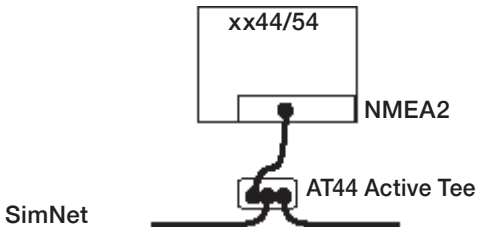
3. NMEA0183, which has been the common standard for marine electronics. Interface connections are made to the receptacle marked "NMEA1" or "NMEA2" on the rear of the cabinet – turn the plug's coupling ring clockwise until it stops.

☞ The unit must be turned off while connecting/disconnecting the interface cable.

SimNet is a high-speed control and data network designed to integrate SimNet products into a complete system. Ready-made cables with small plugs makes it easy to run cables. Only 10 mm (3/8") holes are required through panels and bulkheads. The SimNet accessory program contains the necessary items to make a successful installation, see section 12.10 Specifications.

Plug and Play - once all products are connected and power is switched on, the entire network system will be set up automatically and will ensure optimum performance.

SimNet connection is made via AT44, which is a special SimNet to NMEA converter with a plug for the NMEA2 receptacle and two sockets for SimNet.



SimNet power and termination
The following simple rules should be observed when installing SimNet:

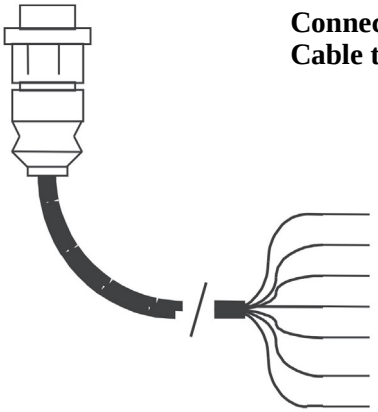
- SimNet must be powered with 12 VDC and connected to the battery via circuit breaker and 5 amp fuse.

- Do not connect the SimNet power cable to the same terminals as the Autopilot Computer, Radar, thruster or other high current products.

- SimNet should normally be terminated in each end, starting with the power cable with termination in one end and termination plug or wind transducer (with termination) in the other end.

12.5.5 Universal connection cable

Transducers are recommended to be 60 to 80 ohms and minimum 1kW. The universal connection cable should be applied for connecting one or two transducers to either ECHO1 or ECHO2 port.



Connection cable (153-3004-002)
Cable type AMW STYLE 2464

Pin	ECHO1 50&200kHz	ECHO2 38&200kHz
1 Red	Speed log	Depth 1+
2 Black (brown)	VCC speed	Depth 1-
3 Blue	Depth 1+	Depth 2+
4 Shield	Shield	Shield
5 White (orange)	Depth 1-	Depth 2-
6 Green	GND*	GND (Temp.)
7 Yellow	Temp.	Temp.

*) Temp./Speed log

12.6 Basic transducer and cable information

For optimum performance of the Echosounder, the Simrad combi transducers C38/200 and C50/200 are recommended. These transducers also include a water temperature sensor. A variety of alternative medium-range transducers is available for vessels mainly operating in shallow waters and/or where the size of the transducer is critical.

The 1kW output signal from the echosounder is automatically reduced due to the difference of impedance in the transmitter, which is 75 ohms, and the transducer, which is 185 to 425 ohms. See section 10.1 Echosounder setup for correct setting for the transducer selected.
The EQXX's transmitter is designed to match Simrad 1kW 75 ohms high performance transducers described in section 12.6.1 Transducers.

The installation should be carefully planned in advance, keeping in mind the standard cable length of 10 meters (32 feet) which is connected to the transducer. In the event where the standard cable is not long enough, up to an additional 10 meters (32 feet) may be connected without a noticeable reduction of the performance. The cable must be of the same type as the standard cable.
☞ The EQXX must be turned off while connecting/disconnecting the transducer cable.

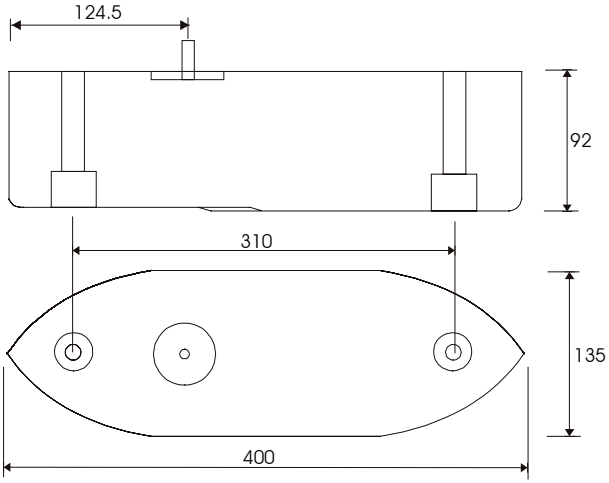
The use of longer cable runs, while possible, always increases the likelihood of increased interference and decreased performance. Care must be taken when increasing the cable lengths to ensure that proper, adequate and consistent shielding is maintained, that cable of adequate cross section is used, and that all connections are properly made and protected from the effects of the marine environment.

If possible, running the transducer cable through a grounded conduit will greatly decrease the likelihood of interference. Likewise, the transducer cable should be run as far as possible from other electrical cabling. If it is absolutely necessary to pass close to other cabling, it is best to keep as much distance as possible, and to make all crossings as close to a right angle as possible.

⚠ **Warning!**
Transducers containing speed log sensor e.g. Airmar B744V must never be connected to the port "ECHO2". To avoid accidental connection, "ECHO2" is sealed with a small silicone plug, which of course is removable so e.g. a combi transducer can be connected.

12.6.1 Transducers (option)

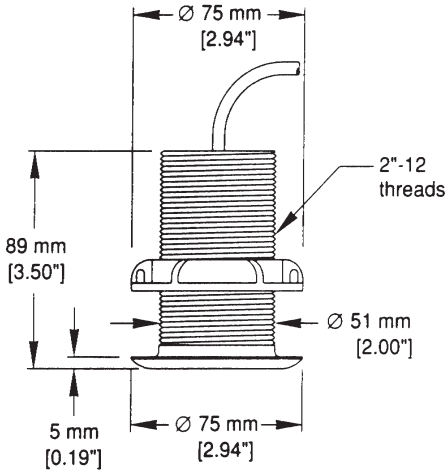
Simrad Combi-transducers C50/200 or C38/200



Combi C50/200 or C38/200 combines two transducers and a temperature sensor in one housing. It has a streamlined shape, designed for mounting onto the hull.

Frequency:	**50 and 200 kHz**	**38 and 200 kHz**
Beamwidth:	longitudinal 10° / 7° transverse 16° / 7°	longitudinal 13°/ 7° transverse 21° / 7°
Maximum pulse power input:	1000 W	1000 W
Maximum continuous power input:	10 W	10 W
Storage temperature:	max.70°C, min. –20°C	max.70°C, min. –20°C
Cable length:	10m (32’)	10m (32’)
Maximum transducer depth:	20 meter	20 meter
	Reference No. 700-3000	Reference No. 700-3001

Airmar P319



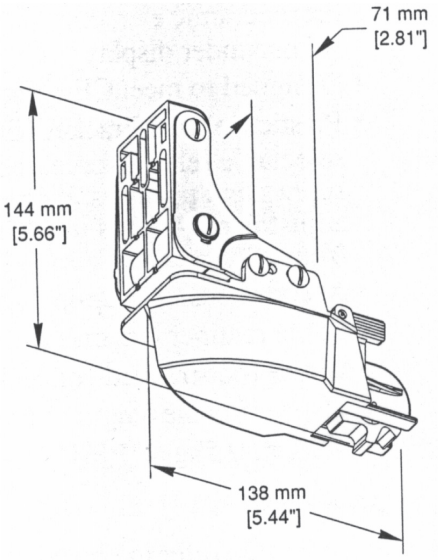
Thru-hull mount

Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32’)
Depth information.

Reference no. 179-0401-002 (P319)
Housing: Reinforced plastic
Recommended for fiberglass and metal hulls. Do not use in wooden hulls!

Reference no. 179-0401-003 (B117)
Housing: Bronze
Recommended for fiberglass and wooden hulls.

Airmar P66



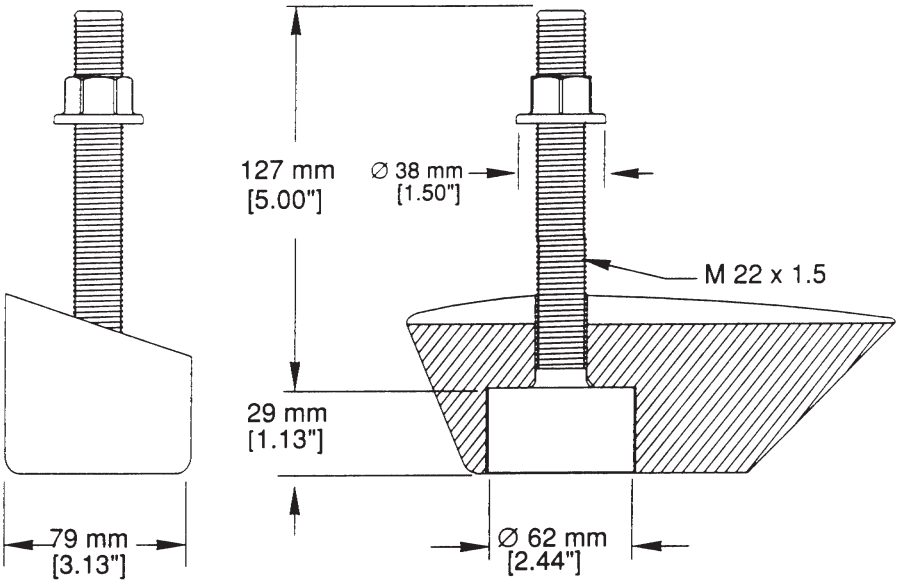
Transom mount

Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32’)
Speed, temperature + depth information

Reference no. 179-0401-001
Housing: Chemical resistant, high impact plastic alloy.
Recommended for all type hulls.

☞ Do not connect to ECHO2 port.

Airmar SS505



Ref.no. 179-0401-011
Optional fairing

Thru-hul stem mount

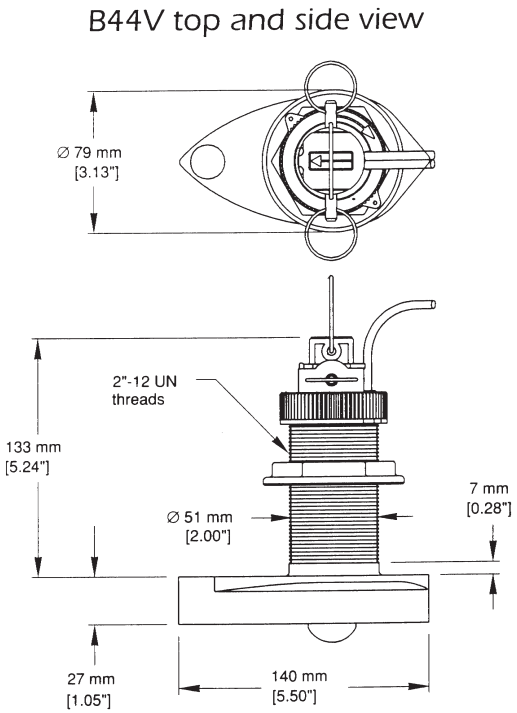
Accomodates hull thickness:
Min. no fairing 6 mm (1/4”),
Max. with fairing 83 mm (3 1/4”)

Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32’)
Depth information.

Ref.no. 179-0401-004 (B45)
Housing: Bronze
Recommended for fiberglass or wooden hulls only.

Ref.no. 179-0401-008 (SS505)
Housing: Stainless steel
Recommended for any hull material.

Airmar B744V



Thru-hull triducer

Frequency: 50/200 kHz
Beamwidth: 45° / 15°
Cable length: 10m (32')
Speed, temperature + depth information.

Ref.no. 179-0401-009 (B744V)
Housing: Bronze
Recommended for fiberglass and wooden hulls.

☞ Do not connect to ECHO2 port.

12.6.2 Determining the position for the transducer

The EQXX is a sophisticated piece of electronic equipment, but how well it will perform under actual operating conditions will be largely dependent upon the location of the transducer and how it has been installed.
Careful consideration, therefore, must be given to selecting the mounting location and on deciding the method of installation that best suits the vessel.

Air bubbles and turbulence caused by the vessel's movement through the water will seriously degrade the transducer's performance. Therefore the transducer should be located well clear of any water intake or discharge line and also clear of any projection along the hull line which might disturb the smooth flow of water. It is of profound importance for good performance of the EQXX that the water flowing over the transducer be free of bubbles and aeration. If the transducer face is clean but the performance degrades with increasing vessel speed, then aeration of the water flowing under the transducer may be the cause of the poor performance.

Due to the varying design of ship's hulls and different operating speeds, there can be great variation in the amount of air bubbles which are carried beneath the hull. These bubbles tend to be carried close to the hull as they pass aft. For this reason, it is desirable for the transducer to be mounted on a fairing block which holds the transducer away from the hull and which directs the flow of aerated water around the sides of the transducer rather than over the face of the transducer.

On deep keeled vessels, care must be taken to ensure that the transducer beam will not be blocked by any part of the keel. Although the appropriate mounting location that meets all requirements depends on the type of vessel and its normal operating speeds, a practical choice is usually somewhere between one third and one half of the vessel's water line length from the bow. Leveling blocks may be designed accordingly to meet this requirement.
☞ The more the transducer protrudes from the hull, the better the results will be.

Particularly at lower frequency operation (38 and 50kHz), interference from propeller noise can be a significant problem. This can be seen as an increase in the "noise" on the echosounder display when the propeller speed is increased. To help reduce this, the transducer's mounting face may be angled slightly forward on the order of 3-5°. The goal is to incline the transducer so that a line of sight along the transducer's radiating surface passes below the propeller.

☞ Keeping the propeller clean and free of any nicks or roughness will assist in minimizing interference from propeller noise due to cavitation.

Sources of noise to consider:

Water/air noise	Acoustic noise	Electrical noise
Air bubbles Turbulence Propeller	Main engine Reduction gear propeller shaft Generators auxiliary engines Power plant for freezers Hydraulic pumps Rudder engine Bow thruster Stern thruster	Noise from electrical cables Noise from generators Poor grounding of instrument Radiated noise from other instruments Dc – Dc converters Electrical winches Neon lights etc.

12.7 Preventive maintenance

Surface cleaning – to keep the EQXX cabinet and display screen clean, wipe the surfaces with a clean damp cloth. For heavier cleaning, use a clean, damp cloth which has been dipped in a solution of a mild dish detergent and water. Wring out firmly before wiping the unit.
☞ Never use cleaning solutions containing spirit, alcohol, gasoline or oils.

Electrical connections – periodically check the electrical connections. Make sure that connections are tight and that no cables are frayed or worn.

Transducer - periodically clean the face of the transducer with a plastic utensil using a scrubbing action.
☞ Do not use a harsh abrasive or a solvent to clean the transducer.

12.8 Repair and service

The EQXX is sealed and does not contain any user serviceable parts. Opening of this unit will void its warranty. If the EQXX requires servicing or repair, call your authorized SIMRAD dealer, but first check Troubleshooting in section 12.9.

Spare parts – fuses may be bought from a chandler or a marine supply store. Use only fuses specified for this unit – see 12.10 Specifications.
If you require a SIMRAD part, please contact your authorized dealer.

12.9 Troubleshooting

For all fault finding, first check that the supply voltage is between 10-32 VDC

Symptom	Check	Remedy
No picture on display screen	Check that the unit is turned on	Press the [PWR] key on keypad
	Check fuse in power cable fuse holder	Replace fuse. Use only type T6.3A slow (5x20mm)
Picture appears on the display screen, but image is too dark or too bright		Press [PWR], adjust light and press [ENT]
No normal picture or key operation		Turn unit off and on again
		Disconnect power and connect power again
		Return to factory presets, see section 11.6
Echo picture appears normal, but no target are shown or only random “noise” is seen	Check that the correct transducer frequency is selected	Change frequency from Echo quick menu, press [ENT], [1] - see section 4.5
	Check that the transducer connectors are securely mated with the unit	Correctly mate the connectors to the unit
	Check that the receiver gain is set high enough	Increase the receiver gain in 4.7 Presentation setup
	Check that the range is correct for the water depth	Adjust the range in 4.7 Presentation setup
Excessive noise in echo picture	Check for correct grounding	Connected equipment must be properly grounded to the main unit
Some values are missing in the engine displays.	Check what type of data output is transmitted from the engine(s) via the databus.	The engine source controls the value of the read-outs.
No data from replaced SimNet sensor.	Check connection of SimNet cables.	Perform SimNet system reset, see section 11.6.

Symptom	Check	Remedy
Unstable or no data from SimNet.	Check connection of SimNet cables. Check for stable 12 Volt supply. Check termination is correct.	Use minimum one termination e.g. the power cable with red disc. Perform SimNet system reset, see section 11.6.
All data is deleted after turning off the unit and turning it back on	Check battery lifetime. Expected lifetime is min. 5 years	Internal battery must be replaced by authorized dealer

12.10 Specifications

General data

Power supply:	12 and 24 V DC (10-32 V DC max) 25 watts
Power cable:	2 m, 4-pin female connector (153-5000-007), inclusive: - power fuse T6.3A slow (5x20mm)
Dimensions:	EQ44-2: H:220 mm (8.8”) W:365 mm (14.6”) D:75 mm (3”) EQ54-2: H:330 mm (13”) W:460 mm (18.1”) D:95 mm (3.7”)
Weight:	EQ44-2: 3.7 kg (8.1 lbs), EQ54-2: 6.6 kg (14.5 lbs)
Environment:	0° to +50°C, waterproof USC 46 CFR and IP55
Housing:	Casted aluminum back, polycarbonate front
Display:	EQ44-2 10”, EQ54-2 15”: TFT color, power backlight, 640x480 pixels, bonded display with Anti-Reflective coating.
Interfacing:	2 ports in/out NMEA 0183 (incl. SimNet/NMEA 2000 via AT44 Active Tee)
- Alarm:	Alarm relay 24 V 0.5 A (contact closure)
Main fuse:	T6.3A slow (5x20 mm)

SimNet control

Maximum number of products connected in a network:.....50 units
Maximum cable length (excl. 30 m wind transducer cable):.....120 m (400’)
Bit rate of the bus:..... 250 kbit/second
Maximum DC current through a single SimNet plug:.....5A
SimNet power supply:..... 10.8 - 15 VDC
Maximum drop cable length:.....6 m (20’)
Maximum total length of all drop cables .....60 m (200’)
Environmental protection: Cable and plug/connector system:.....IP66
Temperature:..... max. 70°C (158°F)

Echosounder section

Frequencies: 38, 50 and 200 kHz, selectable
Output power: Variable up to 1kW RMS per channel
Impedance: 75 ohms
Display ranges: 5 to 2000 m (38/50kHz), 5 to 400kHz) in steps (manual) and auto mode.

Detection ranges:

Frequency	Beam	Fish*	Bottom*
38 kHz	13x21°	410m	1800 m
50 kHz	10x16°	430m	1500 m
200 kHz	7°	280m	400 m

*Single Fish Target Strength: -30dB (60cm cod)
*Bottom Back Scattering Strength: -20dB
*Simrad transducer C38/200 or C50/200

Pulse length: Short, medium, long and auto
Transmission rate: Max. 25 pings per second
Alarms: Fish, max. and min. depth
Zoom mode: Shift, bottom and VRM expansion, 3 to 50 meters, feet, fathoms or Passi braccio (Italian unit).
Event marker: At current ping and depth memory
Picture speed: True distance or time, high, medium, low, and freeze
Noise filter: User selectable on/off
Echo presentation: A-scope and white line discrimination
Temperature: Sensor or NMEA
Speed: Sensor or NMEA

Dual frequency transducers

Simrad C38/200, 1kW high performance combi transducer 38 and 200kHz, 13x21° and 7° beams.
Simrad C50/200, 1kW high performance combi transducer 50 and 200kHz, 10x16° and 7° beams.
Airmar B260-22, 1kW combi transducer 50 and 200kHz, 19° and 6° beams.

50/200kHz medium-range transducers (Airmar Des.A)

B256: 1kW medium range transducer, 16x28° and 4x6° beams.
B45: 600W bronze stem mount transducer, 45° and 15° beam.
B744V: 600W bronze thru hull triducer, depth, speed and temperature, 45° and 15° beam.

P66: 600W plastic transom mount triducer, depth, speed and temperature, 45° and 15° beam.
P319: 600W plastic thru-hull transducer, 45° and 15° beam.

ST850: Speed and temperature only.

Cables and accessories included
Power cable, 2 m, 4-pin female connector incl. fuse T6.3A slow (5x20mm) (153-5000-007)
Universal connection cable for echo transducer, 2 m (153-3004-002)
AT44 Active Tee with connector for SimNet control (153-5555-449)

SimNet cables and accessories (not included)
SimNet cable 0.3 m (1'), (24005829)
SimNet cable 2 m (6.6'), (24005837)
SimNet cable 5 m (16.6'), (24005845)
SimNet cable 10 m (33'), (24005852)
SimNet Tee Joiner, 3 sockets (24005860)
SimNet Multi Joiner, 7 sockets (24006298)
SimNet cable gland (24005878)
SimNet protection plug (24005886)
SimNet termination plug (24005894)
2 m (6.6') SimNet power incl. termination (24005902)
2 m (6.6') SimNet power excl. termination (24005910)
AT10 Universal NMEA0183 converter (24005936)
SimNet cable protection cap (24005928)
SimNet/NMEA2000 drop cable (24005729)

Options
WR20 RemoteCommander
NMEA2 cable, 1.5 m, 9-pin female connector (153-3002-005)
NMEA1 cable, 1.5 m, 9-pin male connector (153-3002-004)
TiltFrame, 10" (700-5000-042)
Sunhood, 10" (140-6515) or 15" (140-6752)

Alarms – can be set to sound a "beep" if the echosounder detects a target above (shallower than) a minimum alarm depth or below (deeper than) a maximum alarm depth. The EQXX allows you to set the alarm depths and to enable or disable both the minimum and maximum depth alarms.

A-scope – a method of displaying the echosounder information. In A-Scope mode, the echoes are displayed in a "bar-graph" format, with stronger echoes displayed not only in the color representing their target strength, but also in a width representing their target strength.

Configuration – the configuration functions of the EQXX allow you to adapt the system more specifically to your needs. You may set Units of measure (feet, fathoms, meters, etc.), Menu languages, Scroll speed, etc.

Depths – DK = Depth below keel, DS = Depth below surface, DT = Depth below transducer.

Echogram background color – is the color shown on the EQXX in the event no target is present. There are three colors to choose from, white, blue or black, where black is especially useful during nighttime operation when the white background could appear too bright.

Echosounder frequency 38, 50 or 200 kHz can be selected to suit the task. 200 kHz is for general purpose and offers optimum discrimination and a narrow transmitter beam. 38 and 50 kHz are for searching in a wider area, determining bottom conditions and going the deepest.

Event marker – allows the user to set a vertical marker on the screen at the current ping to indicate a school of fish, etc.

Measurement units – the user may select the displayed units to be one of the following:

m	meters
ft	feet, 1 foot is 0.3048 meter
fm	fathoms, 1 fathom is 1.83 meters
nm	nautical mile, 1 nm is 1852 meters
kn	knots, nautical mile per hour
km	kilometer, 1 km is 1000 meters
kh	kilometer per hour
mi	statute mile, 1 mile is 1609 meters
mh	mile per hour
Pb	Passi braccio (Italian unit), 1 Pb is 1.65 meters

MENU – the selection of main menus will be shown in the upper part of the screen. Leaf through the menus by means of the cursor key and the [ENT] key, or use the numerical keys to activate one of the menus.

NMEA – National Marine Electronics Association. The NMEA is an organization of manufacturers of marine electronics equipment. They have adopted the NMEA0183 as a standard for communications between various types of marine electronic equipment.

Position update - if, for some reason, there is no position update from GPS or external sensor, the displayed position will start to flash. Once normal position updated is resumed, the flashing will stop.

TFT – Thin-Film Transistor (Active matrix) display.

Transducer – the transducer serves as the acoustic “loudspeaker” and “microphone” to send and receive the signals through the water. They are most often made from ceramic elements carefully built into a robust housing. The ceramic elements change shape when a voltage is applied across them (when the EQXX transmits a signal), and they also generate a voltage when they encounter sound waves (as when the EQXX is receiving an echo).

XTE - Cross-Track-Error (-Distance), measured magnitude of the position error perpendicular to the intended track line.

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SIMRAD
A KONGSBERG Company

EU Declaration of Conformity

CE

I, the undersigned, hereby declare that the following equipment complies with the relevant essential requirements in the EMC Directive.

Conformity assessment	EMC Directive 89/336/EEC of May 3rd, 1989
Employed harmonised standard	EN60945.2002 Article 9, 10, and 12
Equipment category	Navigational equipment intended for world-wide use aboard non-SOLAS vessels
Model(s)	Simrad EQ44-2 and EQ54-2 Echosounder
Remarks	
Manufacturer	Simrad Støvring AS Østre Allé 6, DK-9530 Støvring Denmark Telephone +45 98373499 Telefax +45 98373807

Signed ……..…… 14 April 2005

Odin Sletten, Customer Support Manager

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified below:

CATEGORY "A":
•Autopilots •Radars •Instruments •Navigators •Radiotelephones •Plotters •Gyro compasses incl. sensitive elements •Sonars •Echosounders •Trawl Instrumentation •SatCom •SatTV.
These products are warranted for a period of 24 months on parts and 12 months on labor from date of purchase, except for category B items. Consumable parts such as lamps, fuses, batteries, bearings, etc. are not covered by this warranty.

CATEGORY "B":
•Antennas •Transducers •Trawl sensors •Monitors (CRT/LCD) •Radar magnetrons •Disk drives.
These items are warranted for a period of 12 months on parts and labor from date of purchase.

WARRANTY SERVICE is available through authorized service dealers or national distributors worldwide. Products returned will, at the sole discretion of Simrad, either be repaired or replaced free of charge within normal working hours. Freight charges, insurance, duties or any other costs are the responsibility of the customer. Maximum liability shall not, in any case, exceed the contract price of the products claimed to be defective.

ON BOARD SERVICE can be arranged by authorized local service dealers or national distributors upon request. Labor costs for the repair/replacement of the defective modules/parts will be free of charge provided a valid warranty is confirmed. Overtime, travel, lodging, per diem, insurance, duties or any other costs are the responsibility of the customer. Additional expenses connected with replacement of transducers such as dry docking, diving and precautionary measures are not covered by this warranty.

VALIDITY: This warranty is effective only when warranty certificate or proof of purchase and equipment serial number is presented. Furthermore, the installation and operation has to be carried out in accordance with the product manual. Warranty liability does not apply to any equipment which has become inoperative due to misuse, accident, neglect, sea water damage or unauthorized repair. Simrad will not be liable for any loss, incidental or consequential damages whether based upon warranty, contract or negligence, or arising in connection with the sale, installation, use or repair of the product. Consequential damages include, but are not limited to, any loss of profit, property damage or personal injury.

The terms of warranty as described does not affect your statutory rights.

WARRANTY CARD

TO BE RETAINED BY THE OWNER

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark

SIMRAD
THE FULL PICTURE

_____
OWNER

_____
ADDRESS

_____
VESSEL

_____
HOME PORT

_____
TYPE

SERIAL NO.

_____
EQUIPMENT

_____

_____

_____
DATE OF PURCHASE

_____
DATE OF INSTALLATION

YES:_____ NO:_____
INSTRUCTION FOR USE GIVEN

_____
AUTHORIZED INSTALLER/DEALER STAMP

SIMRAD warrants that every product shall be free of defects in material and workmanship as specified overleaf:

tear out

WARRANTY CARD

To be mailed to the NATIONAL DISTRIBUTOR (see overleaf) together with the installation report WITHIN 14 DAYS from the date of installation.

Simrad Støvring AS
Østre Allé 6
DK-9530 Støvring
Denmark

SIMRAD
THE FULL PICTURE

_____
OWNER

_____
ADDRESS

_____

_____
VESSEL

_____
HOME PORT

_____
TYPE

SERIAL NO.

_____
EQUIPMENT

_____

_____

_____

_____
DATE OF PURCHASE

_____
DATE OF INSTALLATION

_____
(CUSTOMER'S SIGNATURE)

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(DEALER'S SIGNATURE)

STAMP
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NATIONAL SIMRAD DISTRIBUTOR:

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